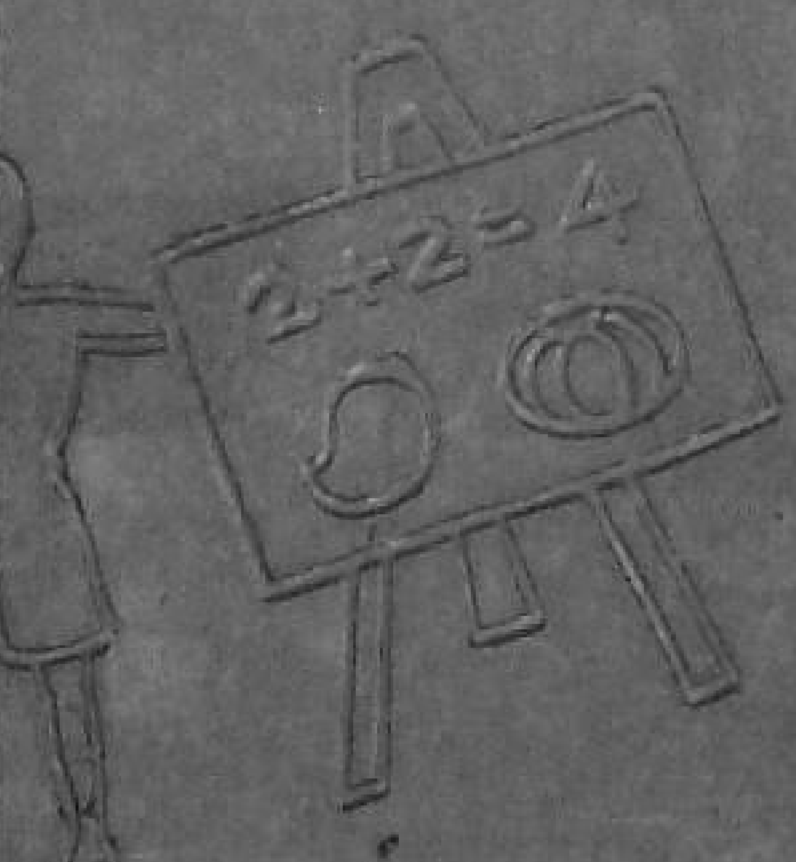
Handbook for Teachers of Basic Schools



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GOVERNMENT OF INDIA
1956

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OF
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INTRODUCTION

This Handbook is being published in belated fulfilment of a long delayed promise. The Central Advisory Board of Education had appointed a Committee on Curriculum in Basic Schools, which had recommended amongst other things, that the Ministry should bring out a Handbook of Suggestions for teachers of Basic schools. The project was readily taken up but it was found to be a very difficult undertaking. We adopted the obvious approach of contacting some of the most experienced persons in the field of Basic education and invited them to contribute different chapters for the proposed Handbook. It transpired that some of them were not prepared to do so, because of their various other preoccupations—as if, to a devoted and well informed worker in this field, anything could be of more vital interest than putting across the right ideas and techniques of the new system to the teachers of the country. Some promised but were not as good as their promise and reminders were treated with the respect they usually receive. There were yet others who did actually respond to the request, but it transpired that they could not put across their ideas with the vividness, the simplicity and the concreteness which are essential in a publication of this kind. Anyway, it was a path strewn with many disappointments but ultimately persistence seems to have triumphed and we have been able to secure the necessary material from a number of Basic educationists and others conversant with their special subjects. I am thankful to them, as well as to Dr. Salamatullah of the Teachers' Training Institute, Jamia Millia Islamia, Delhi, who undertook to edit the material and give it a certain coherence and unity which it might have otherwise lacked and to eliminate something of the duplication and overlapping which are often the necessary result of joint authorship.

As readers will see, the Handbook is divided into two parts. The first part deals with the aims and objectives of Basic education, its place in the modern industrial age and certain other general problems like organisation of Basic schools and the technique of correlated teaching. This is meant to provide a general background for the chapters that form Part II and cover the methodology of the various parts of the curriculum. From one point of view, it may seem somewhat unorthodox to devote separate chapters to the teaching of "subjects" like Social Studies, General Science and Mother Tongue, for it may well be argued that Basic education does not recognise, at least in the earlier stages, this division of the curriculum into separate subjects. This is true to some extent but it would not be wise to press the idea too far. The objective of relating all knowledge to life and life-situations—of which the craft-situation is one, though undoubtedly of primary importance—is commendable but it is by no means easy and the average teacher has to be guided to *grow into* that extremely difficult and thought-challenging technique. He has to study carefully the methods of introducing the various subjects, of linking them up with one another, of choosing the right kinds of techniques and exercises suited to each and ensuring that they develop into a coherent unity. He has also to realise how there will be, in the upper classes at least, elements of subject matter which

may not be directly correlatable with the craft or the social and physical environment and, therefore, he should find other methods of presenting them in an interesting and realistic manner so that they too become a part of his duly assimilated knowledge. For all these reasons, it was considered necessary to include these chapters which may help the teacher in building a bridge between his present methods of teaching and the desirable basic techniques.

It is not claimed, by any means, that the material included in this Handbook is the last word on the subject. It is, if I may say so, not even the "middle word". There is still not only much room, but *imperative, need,* for experimentation, for trying out promising ideas, for organising the curricular content into projects and lively units of activity. *No one* today is in a position to say the last word on the basic technique which, in practice, is still so new. It will require devoted and intelligent application on the part of numerous teachers before it can be used confidently and successfully by the profession. This will naturally take time and the labour of creative thinking as well as self-critical experience. It is easy to walk in set grooves and achieve modest targets but much more difficult to strike out in the open and strive for exacting goals. Those who seek to crystallize this system prematurely do it less than justice. If, as I have said elsewhere, it is treated as "a walled-in system, entrenched in orthodoxy, to which creative experience can add nothing and from which critical assessment can substract nothing, it will suffer the fate of other life-giving ideas and wither into impotence."

Readers will appreciate that this Handbook is being brought out as a tentative and exploratory publication so as to be of some help to the increasing number of basic teachers who need help and guidance. If we delayed its publication further in the hope of achieving "perfection", the best may well turn out to be the enemy of the good. In making it available, it is our hope that it will be helpfully criticised by experienced teachers and such constructive criticism will lead to its gradual improvement in subsequent editions. The Ministry is planning to bring out a Hindi Edition and suggesting to the State Governments that they may publish its translations or adaptations in the various regional languages so that it could be used by the large number of Primary school teachers who do not have adequate knowledge of English or Hindi.

(K. G. Saiyidain)
Educational Adviser to the Government of India.

New Delhi,
March 26, 1956.

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BASIC EDUCATION IN A MACHINE AGE

Although India is primarily an agricultural country, she has gradually begun to move towards industrialisation. The development of multi-purpose irrigation and power projects which we have undertaken will bring about great changes in the nature of our economy and in the life and habits of our people. As our Five-Year Plan progresses the occupational pattern of our economy is bound to change and a larger percentage of the population will be employed in our industries than at present. Rural electrification will bring about far-reaching changes in the operation of agricultural processes and also in the nature of cottage industries. Village industries which are at present of a rudimentary character are likely to be transformed. The methods of production and organisation will also have to be radically altered in order that these industries may find their proper place in the economy of the country. In short, science and technology are rapidly changing our backward and primarily agricultural society into a modern industrial society.

Education must take into account the dynamic character of our society and assume the moral responsibility of preparing our youth for it. Education cannot remain aloof from the powerful social and economic forces which are changing the social and economic pattern of our society. In fact, education itself becomes an instrument for these changes and the School should serve as an agency for promoting them. The school has a two-fold purpose. It reflects the changing pattern of our society and at the the same time defines the direction towards which social reconstruction should move. As our economy undergoes a process of tranformation it must inevitably bring about changes in all the aspects of education—the content of curriculum, organisation and methods of teaching.

Under the inspiration of Mahatma Gandhi, we have adopted Basic education as the pattern of national education. The distinctive feature of this education is that it makes productive work the main basis of the whole educative process. When Gandhiji introduced the idea of education through productive work, there was violent opposition from those sections of our society which wanted to perpetuate the artificial distinction between work and leisure, culture and service, and vocational and literary education. The opposition could easily be understood. By introducing the element of work as an essential and integral part of education, Gandhiji was striking at the every roots of those beliefs and attitudes which had maintained for centuries a hierarchial society in our country. The intellectuals at the top enjoyed all the advantages of cultural pursuits while the manual workers at the bottom were mere tools for the benefit of others. This discrimination against those who work with their hands and produce material goods for the society is at the root of most of our social ills. Gandhiji wanted to evolve a system of education which could help remove this evil which is eating into the vitals of Indian society. It is not, therefore, surprising that there was a storm of protest from the conservative sections of our society who were interested in preserving their vested interests.

But the principles of Basic education are so sound, that they are now generally being accepted by the people at large. Even those educationists

who emphasise liberal education have now begun to realise the value of manual work both for intellectual training and for training in different vocations.

Educational theory has now gone so far ahead that few people in our country will question the utility of manual work in the High school curriculum. Some people, however, still find it difficult to reconcile themselves to Basic education in which craft is supposed to become the very medium of all education. Some yield only to the extent of admitting that in rural areas, where agriculture is the basic occupation for a majority of the people, it is quite feasible to introduce Basic education, but they do not accept that it can be suitable for urban areas which are highly industrialised. Even in rural areas, when we introduce electricity and mechanise our farming and other cottage industries, they would question the utility of placing so great an emphasis on crafts. They maintain that as society gets mechanised, the value of handicrafts will gradually diminish. Objections and doubts like these are mostly based on misunderstanding about Basic education.

By adopting Basic education, we do not by any means wish to cling to a primitive type of economy. On the other hand, we aim at all-round development, including the field of science and technology, for improving the economic life of our people and eradicating poverty from our country. Basic education is an attempt to promote agricultural and industrial production with the help of science and technology. Education cannot remain a living force if it does not keep pace with the changes and developments that take place in the social organisation and economic life of the people.

It is not right to assume that Basic education is intended to be practised in rural areas only. It is, in fact, a plan of national education for the whole country, including both rural and urban areas. Crafts selected will, however, differ from region to region, in keeping with their local traditions and educational possibilities. As we introduce electricity in our villages, there will be a greater variety of occupations than at present, and that will require a wide range of knowledge and skills. Consequently, the scope of craft work in Basic schools will become wider. The farmer must, then, be equipped with an understanding of animal husbandry and poultry, soil conservation, fertilizers, control of diseases and pests, marketing and keeping of accounts. He must also be able to make ordinary repairs of motor machinery, plumbing, and electrical equipment. As these new occupational needs arise, it is obvious that the Basic curriculum will also undergo corresponding changes. It is only in this way that a proper coordination can be maintained between the needs of production and education. In fact there is no rigidity in the curriculum of Basic education. When the farmers begin to use automobiles, tractors and other farm machinery, many Basic schools will also very kindly operate a workshop where the children will learn to handle machinery and also do ordinary repairs of the mechanical appliances used in farming.

Education has to take into account the various aptitudes and interests of children. There may be some who wish to settle down to farming after completing their Basic education, others may look forward to higher studies as a preparation for liberal or technical professions, while there

may be some children in rural areas who wish to proceed to work in industry or business in urban areas.

In order that none of these types of children may be handicapped, Basic education has to provide for a variety of occupations. At present there is a wide gulf between the educational facilities available for children in urban and rural areas. Every possible effort should be made to bridge this gulf. As long as we believe that rural children should have altogether a different type of education from urban children, we help in maintaining the barriers between these two sections of our society. The environmental conditions being different in urban and rural areas there is bound to be a change in the emphasis on occupations and curricula, but as our society moves forward towards better planning, decentralises our industries, operates them in rural areas and introduces electricity and better means of communication in our villages, these differences will be greatly diminished. If we wish to develop a homogeneous culture in our society, we cannot have one type of education for the wealthy classes and an inferior type of education for the poorer classes. Unfortunately most of our Basic schools so far have been started only in rural areas and this gives an impression that Basic education is meant only for the village people. The schools in big towns continue to follow the traditional methods of book learning and there is still a good deal of resistance among the urban people to changing of school methods and curriculum. It is still believed that literary education is a better type of education and provides better opportunities of employment. In fact, in one sense there is a greater need for Basic education in urban than in rural areas. In rural areas the children who participate in the life of the farm or other allied occupations of their families have certain types of rich experiences. In performing their jobs, the children come into direct contact with actual life and the experience they get forms the basis of further education. On the other hand, in large towns and big industrial cities the children miss the opportunities of rich experience and direct contact with life. There is no doubt that modern industrial economy, based on great technological advances, has also brought in its turn advantages for humanity. But, from the educational point of view, it offers only limited possibilities of growth, intellectual and emotional, because of the restricted experiences that are available. Basic education will, therefore, be a blessing to all the children, specially those of urban areas. Because of the association of education with work, new possibilities of intellectual and emotional development will be opened up for our children. Indeed, Basic education will compensate in many ways for those losses which the transition, from an agricultural to an industrial economy, brings about.

Another aspect of Basic education about which doubts have been raised is the place it assigns to crafts. How will the students trained in the practical arts and crafts fit into a modern industrial society which requires specialised vocational skills and mechanical efficiency ? Can the experience gained from such crafts as spinning, agriculture, cardboard and leather work in any way equip the students for modern industries which need a large number of workers of all kinds, semi-skilled operators, skilled mechanics, foremen, junior technical workers, engineers and higher executives ? In the first place, it must be pointed out that Basic education only provides for general education and not for vocational education in the true sense of the term. In Basic education crafts are taught not so much to develop specialised vocational efficiency as to enable the children to under-

stand their physical and social environment and to appreciate the social value of productive work as an essential part of their training for citizenship. Through various crafts, the students develop an appreciation of the tools, machines and work processes of contemporary life and are thus better equipped to face their problems in an intelligent way.

As home and community life no longer offer adequate opportunities for the study of practical arts and crafts, it is important that the school should take up the responsibility of teaching young people something about the production, distribution and use of consumable goods. The students can develop intelligent understanding about those matters, only by having firsthand experience of dealing with the material processes and forces involved.

Though Basic education is not intended to train children directly for occupations, it undoubtedly has better training value for vocations than mere bookish education. When the children are actually engaged in productive activities they learn useful habits of work—cooperation, reliability, resourcefulness and willingness to assume and carry out responsibilities. While taking up practical projects they develop the habit of planning carefully every undertaking before beginning to work. They also acquire the habit of concentration and of working with speed and accuracy and of evaluting the outcome of their work. All these habits and skills which Basic education attempts to develop in children by engaging them in practical projects will be great assets in every field of modern industrial society. Once the essential habits of work are developed, the children will be better fitted to undergo vocational training for rural as well as urban occupations.

Basic education has two other educative values which are of special significance to modern industrial society. When the children are engaged in handicrafts they have the joy and pride of creative work. Among the various evils which have resulted from modern industries, the major one is that the worker in a factory works mechanically and does not identify himself with his product as is the case with the craftsman who puts his whole soul into the work he undertakes. The craftsman has, therefore, a greater emotional satisfaction in doing his job than a worker in a factory. The greatest need of industrial life today is not only higher productivity and higher wages,—both of which are important—but the attainment of joy through labour and development of personality through work. Basic education which attempts to integrate the personality of the child through work and harmonize the relationship between the city and the village will help to bring about a wholesome industrial system. The children who are educated through work will be intellectually and emotionally mature persons and when intelligent and balanced men and women are engaged in the task of production they are bound to improve the methods of production also. Basic education thus not only corrects the shortcomings of the industrial system by providing emotional satisfaction but will ultimately improve technical efficiency by creating better understanding in the worker of the industrial process.

With the expansion of Basic education, it will be necessary to classify students for General and Technical education and also for training for various occupations. The system of Basic education will make the problem of classification and vocational guidance easier. When the students are engaged in practical activities, one can easily discover important traits

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of character as well as deficiencies present in them. Special abilities, talents, and aptitudes can be more easily assessed when the students are carrying out actual work projects in the field or workshop than in the artificial atmosphere of a psychological laboratory. Basic education thus gives teachers a better opportunity to gauge the special abilities of children than is possible in the schools of the conventional type. Under intelligent direction it can also develop latent aptitudes and interests that can later on form a basis for guidance in the selection of a vocation. Basic education in this way serves a very useful need of industrial society. It enables us to discover the special aptitudes and talents of children and to give them proper direction so that their abilities may be properly utilised for their own progress as well as for the welfare of the community.

To sum up, Basic education does not create obstacles to industrial development. It envisages a distinctive type of social order in which every body performs some productive work. Certainly there is no intention on the part of its promoters to stand in the way of industrial progress and perpetuate a backward peasant economy. Even if a reversal of history be possible, it will not be desirable to take such a step because it will practically mean a denial of all the scientific inventions and discoveries which could be utilised for human welfare. Far from doing this, Basic education makes a positive effort to promote industrial production by introducing the children to the actual methods of production from the very initial stages of their education. It develops those qualities of character and habits of work which will make a person successful in an industrial society. Lastly, by making work the basis of all educative experiences, Basic education seeks to cut across the barriers which divide our rural and urban population and intellectual and labour classes. Thus while Basic education promotes industrial development, it avoids those pitfalls of an industrial civilisation.

CHAPTER I

THE AIMS AND OBJECTIVES OF THE BASIC CURRICULUM*

The general aims and objectives of Basic education have been elucidated so well in the Report of the Basic National Education Committee (1937) that it seems unnecessary to repeat or paraphrase them here. Moreover, there has been so much discussion of the educational ideas and principles implicit in the scheme since that teachers and others interested in it can refer easily to many available reports and other publications bearing on this subject. So far, therefore, as the general aims of Basic education are concerned, I shall content myself with reproducing the statement on the concept of Basic education which was recently formulated by the Standing Committee of the Central Advisory Board of Education on Basic Education and which has had a favourable reception in the country.

"The term 'Basic Education' has been interpreted and sometimes misinterpreted, in a variety of ways. This is, to some extent, understandable because it is a comparatively recent development and its concept and technique are still in the making. It seems necessary, therefore, to state clearly what we mean by Basic education.

Broadly speaking, we would like to point out that the concept of Basic education is the same as that defined in the Report of the Basic National Education Committee (The Zakir Husain Committee) and elucidated by the Central Advisory Board of Education. It is clear that the basic principles and techniques, as made out in that Report, should guide and shape educational reconstruction in India. So far as the provision of eight years of compulsory universal schooling and the use of the mother tongue as the medium of instruction are concerned, there is no difference of opinion about them. They have now come to be universally accepted and need no further elucidation, except in so far as it may be necessary to stress the intrinsic wholeness of the entire period of Basic education, covering the Junior as well as Senior basic grades. The other implications and features of Basic education that need to be clarified and stressed are the following :—

1. Basic education, as conceived and explained by Mahatma Gandhi, is essentially an education for life and, what is more, an education through life. It aims at creating eventually a social order free from exploitation and violence. That is why productive, creative and socially useful work in which all boys and girls may participate, irrespective of any distinction of caste or class, is placed at the very centre of Basic education.

2. The effective teaching of a basic craft, thus, becomes an essential part of education at this stage, as productive work, done under proper conditions, not only makes the acquisition of much related knowledge more concrete and realistic but also adds a powerful contribution to the

*This was originally published under the auspices of the office of the Educational Adviser to Bombay Government and has since been revised specially for this Handbook.

development of personality and character and instils respect and love for all socially useful work. It is also to be clearly understood that the sale of products of craft-work will meet some part of the expenditure incurred in running the school or that the products will be used by the school children for getting a mid-day meal or a school uniform or help to provide some of the school furniture and equipment.

3. As there has been controversy and difference of opinion regarding the position of craft work in Basic schools, it is necessary to state clearly that the fundamental objective of Basic education is nothing less than the development of the child's total personality which will include productive efficiency as well. In order to ensure that the teaching of the basic craft is efficient and its educative possibilities are fully realised, we must insist that the articles made should be of good quality, as good as children at that stage of their development can make them, socially useful and, if necessary, saleable. The acquisition of skills and the love for good craftsmanship have deeper educative significance than merely playing with the tools and raw materials which is usually encouraged in all good activity schools. This productive aspect should in no case be relegated to the background as has been usually the case so far, because directly as well as indirectly, efficiency in the craft practised undoubtedly contributes to the all-round development of the child. It sets up before children high standards of achievement and gives them the right kind of training in useful habits and attitudes like purposeful application, concentration, persistence and thoughtful planning. While it may not be possible to lay down specific targets for productivity at this stage, it should be the teacher's endeavour to explore its economic possibilities fully with the emphatic stipulation that this does not in any way conflict with the educational aims and objectives already defined. However, it has to be stated that, in the upper classes of Junior Basic schools and in the Senior Basic schools, it should not be difficult for States to lay down certain minimum targets of production in the light of carefully assessed experiences.

4. In the choice of basic crafts which are to be integrated into school work, we should adopt a liberal approach and make use of such crafts as have significance from the point of view of intellectual content, provide scope for progressive development of knowledge and practical efficiency. The basic craft must be such as will fit into the natural and social environment of the school and hold within it the maximum of educational possibilities. The idea that has been wrongly created in the minds of some people that the mere introduction of a craft in a school, e.g., spinning can make it a basic school does grave injustice to the concept of Basic education.

5. In Basic education, as indeed in any good scheme of education, knowledge must be related to activity, practical experience and observation. To ensure this, Basic education rightly postulates that the study of the curricular content should be intelligently related to three main centres of correlation viz., craft work, the natural environment and the social environment. The well-trained and understanding teacher should be able to integrate most of the knowledge that he wishes to impart to one or the other of these centres of correlation, which form important and natural foci of interest for the growing child. If he is not able to do so, it either means that he lacks the necessary ability or that the curriculum has been burdened with items of knowledge which are not really impor-

tant and significant at that particular stage. It should also be realised, however, that there may be certain items in the syllabus which cannot be easily correlated directly with any of the three above centres. In such cases, there should be no objection to these being taught according to the methods of teaching adopted in any good school. This means, that, even in the case of such lessons, the principle of interest and motivation and the value of expression-work will be utilised. In any case, forced and mechanical 'associations' which pass for correlation in many schools should be carefully avoided.

6. The emphasis on productive work and crafts in Basic schools should not be taken to mean that the study of books can be ignored. The Basic scheme does postulate that the book is not the only or the main avenue to knowledge and culture and that at this age, properly organised productive work can in many ways contribute more richly both to the acquisition of knowledge and the development of personality. But the value of the book, both as a source of additional systematised knowledge and of pleasure cannot be denied and a good library is as essential in a Basic school as in any other type of good schools.

7. The Basic scheme envisages a close integration between the school and the community so as to make education as well as the children more social-minded and cooperative. It endeavours to achieve this, firstly, by organising the school itself as a living and functioning community—with its social and cultural programmes and other activities—secondly, by encouraging students to participate in the life around the school and in organising various types of social service to the local community. Student self-government is another important feature in Basic education which should be envisaged as a continuous programme of training in responsibility and in the democratic way of living. In this way, the Basic school not only helps in cultivating qualities of self-reliance, cooperation and respect for dignity of labour but also becomes a vital factor in the creation of a dynamic social order.

8. Basic education should no longer be regarded as meant exclusively for the rural areas. It should be introduced equally in urban areas both because of its intrinsic suitability and also to remove the impression that it is some kind of inferior education designed only for the village children. For this purpose, necessary modifications may have to be made in the choice of basic crafts for urban schools and even in the syllabus but the general ideals and methods of Basic education should remain the same.

It would, however, be worthwhile to elucidate and interpret the Basic curriculum in the light of these general principles. In a way, it is much easier to formulate general principles but much more difficult to apply them in the elaboration of methods or curricula or in the day-to-day working of the schools. The ordinary teacher has to spell them out in terms of his actual programmes of work and he has to see their relationship to the total educational picture. I am convinced that no teacher can teach a "subject" adequately—or even a single topic pertaining to a subject—unless he has an understanding of the curriculum as a whole and the place of his own particular subject in it. If that is true of traditional "subjects" which are mainly treated as independent units, how much truer is it of the Basic curriculum in which there is no compartmentalisation and knowledge is taken as an integral unity whose component parts are closely

interrelated through their coordination with crafts and through the principle of activity ?

1. Child's Experience as the Starting Point

In order to appreciate duly the principles and ideas underlying the Basic Curriculum, as envisaged in the scheme of Basic National Education, it is necessary to form a proper conception of the place of the curriculum in education and to understand its significance in the development of the child. The curriculum is primarily an aid in the process of adjusting the child to the environment in which he functions from day to day and the wider environment in which he will have to organise his activities later. This process of active mutual adjustment in which the child and his world act and react on each other goes on spontaneously from the very begining of the child's life long before he comes to school, and continues throughout his life. In the course of this mutual interaction, the child begins to gain experiences of various kinds—social, geographical, historical, manual, mathematical, and so on. He watches the phenomena of sunrise and sunset, the spreading flush of dawn and the gradual falling of dust, the clouds, the rain, the fields and the trees, and all these constitute the basis of his knowledge of Geography. He sees various kinds of buildings, dresses, specimens of arts and crafts of previous days ; he comes across pictures of old times ; he sees different kinds of vehicles plying side by side in his town or village. These and many other observations of a similar kind bring to his notice the fact of change, of the gradual process of evolution as it has been going on during the ages. In other words, he comes to acquire, in however rudimentary a form, a consciousness of the processes of History. Similarly, he comes into contact with various things in different numbers and quantities, begins to apprehend forms and sizes and quantities which serve as the foundation for his later mathematical knowledge. He comes into relationship with the members of his family, his neighbours and fellow villagers or townsmen ; he establishes contact with them for various purposes ; he sees them engaged in different kinds of activities and realises how, for the fulfilment of his daily needs, he is dependent on them. Experiences of this kind begin to " socialise " him and give him the rudiments of knowledge about social relationships. One can go on multiplying such instances. This would, however, suffice to make it clear that the starting point for all knowledge is the experience acquired by the child in the course of his everyday life as he comes into contact with the world of nature and the world of society in the midst of which he has to work out his purposes. No school can be an effective instrument of education which fails to utilise this store-house of direct, vital, first-hand experiences acquired by the child in the course of his out-of-school life, in the "real" world which is not a world of abstract symbols and books but one full of practical and interesting realities.

2. Curriculum Should Organise and Develop Experience

This approach to the problem should enable us to visualise the part which a properly balanced curriculum can, and should, play in the education of the child. The experiences gained by him in his out-of-school contacts are often unorganised, miscellaneous, depending not on any carefully planned out scheme for the acquisition of rich and selective experiences but on chance happenings and the exigencies of the immediate environment. Thus, a child living in a small village will no doubt acquire

a certain amount of information about birds and plants, crops and seasons, but he may not become acquainted with the facilities provided by modern civilisation, in the way of lighting or locomotion or trade. Conversely, the urban child is often left utterly ignorant of the pulsating life of Nature in the countryside ; he misses not only its aesthetic appeal but also fails to realise the dependence of the town on the village and all its social and economic implications. Again, while the rural child acquires a great deal of scattered information about the life and habits of birds or growth of plants or the vagaries of the wind and the weather, he is not able to see their inter-connections or to visualise them as a scientific or systematic whole. In other words, his experience may lack coherence, unity and organisation ; it may be rich in observation but leave him unable to "interpret" it, to draw inferences from it or form generalisations on the basis of which alone man can organise his knowledge intelligently. So, one of the most important functions of education, and of the school—on its intellectual side—is to provide for the gradual organisation and development of the experiences gained by the child outside the school so that they may ultimately develop into systematic branches of knowledge capable of being utilized as instruments for fuller living. It will be just as undesirable educationally to leave the children's original, natural experiences undeveloped and unsystematised as to ignore their native potentialities and appeal in formulating the educational curriculum.

The school has to guard against both these dangers. The traditional school has tended to lay undue stress on the logically elaborated subject matter, arranged in neat water-tight compartments and calculated to substitute symbols and conventional signs for realities. It has failed to exploit the possibilities inherent in the spontaneous outburst of children's activities and experiences. They are often set to learn mathematical tables or geographical definitions or reach abstract and remote subject matter before they have acquired sufficient experience of concrete quantities or made sufficient observations about their immediate geographical environment or acquired facility in oral expression or even mastered the requisite store of words and ideas to be able to read intelligently. Thus, in the Primary and even Secondary schools, one often comes across children who are able to recite many things parrot-wise but are entirely unable to relate what they have studied in schools to their own observations and experiences. A child in the third grade might point to a river on the map and give a definition of the river in terms of his geography textbook but he may be unaware of the fact that the stream flowing through his village has anything to do with the "river" described in his geography book! There is the true story of a boy who had read a whole lesson on cotton and its various uses, but when he was asked to state where cotton came from, he innocently replied that it came from the backs of some animals like sheep! There is also the well-known story of a London child evacuated to the countryside during the blitz who was amazed to find that goats, sheep and cows were not only pictures in books but living and walking animals which could be seen and played with. Now, any teaching which divorces such knowledge from experience so glaringly and any curriculum which fails to guard against this danger stand condemned.

On the other hand, there is another danger from which many of the 'newer' schools are apt to suffer. They are anxious to preserve the child's spontaneity, to let him develop along his own lines and to give him sufficient room for self-expression. In their anxiety to provide for this, they

are naturally careful not to overburden the child with academic subject matter and book knowledge which he may be unable or unwilling to assimilate. As a reaction against the present bookish tradition of our schools this is a healthy precaution, but somtimes it tends to place an exaggerated emphasis on the child's spontaneous activity. The teacher allows him to "play" without gradually guiding the play towards earnest, interested "work", with the result that the child fails to acquire the intellectual and moral benefit of disciplined, purposeful and concerted activity pursued with some definite aim. Therefore, a properly organised school should, on the one hand, start with the child's native interests, experiences and observations and base its teaching on that foundation and thus press his instinctive energies into the service of his education. On the other hand, it should so organise its work and curriculum that the child's early, undifferentiated experiences become more interrelated, more systematic, more enlightened than they would be without the intervention of the school as a special educative environment. An example may make the point clearer. A teacher of Geography should work as a tactful and intelligent intermediary between the child's natural interest in, and acquaintance with, geographical phenomena and the systematic knowledge of Geography which he wishes to impart and which he visualises partly as a scientific and partly as a humanistic study. When the child comes to school, he knows or soon learns—that the sun rises every morning from the East, that days are sometimes longer and sometimes shorter, that, in certain parts of the year, it is warm while in other parts it is cold, that the rainfall has certain marked effects on the crops, that malarial fever often occurs after rains and so on. The business of an intelligent teacher—and of a properly regulated curriculum is to see that by means of directed observation, illustrations, comparison of notes, keeping of records, the child gradually comes to realise the phenomena of the rotation and revolution of the earth and how these affect his life, the changes of seasons, the reaction of climate on the life of animals and plants, the precautions to be observed during and after rains and many other connected things which are not only of scientific interest but impinge on our daily life and without which we cannot regulate it intelligently. Thus the fundamental principle, in the formation of the curriculum, is that it should start from the child's innate interests and impulses, should take into account his natural modes of self-expression, and the needs of his environment, and build up all its superstructure of knowledge gradually and imperceptibly on their basis—e.g., the child's broken but expressive prattle, his desire for play and physical activity, his interest in the manifestations of social and natural life around him.

It also follows from this that, since the child is essentially an active being, always interested in the expression of his physical energy, in making and breaking things, in manipulation of materials, the natural method of his learning is through doing. He can best acquire knowledge in the early stages, by participating in different activities in the course of which knowledge may be acquired as a valuable bye-product. This gives us not only an insight into the nature of method but also a clue to the organisation of the curriculum. If curriculum is visualised as a set of fixed subjects to be taught by the teacher and assimilated by the child, it will be a mass of dead, inert information which cannot quicken his interest or enrich his activity. It is, therefore, essential that the curriculum should be visualised as "an Activity Curriculum", and the "schools should be transformed into places of work and experimentation and discovery"

where children learn by doing things and do not absorb second-hand information passively. A study of the Basic syllabus will show that this point has been stressed in formulating the curriculum of all subjects of study, and indications have been given to show how items included in the syllabus can be taught through concrete life situations relating to the child's environment.

3. Curriculum Should Develop Certain Desirable Attitudes

The second important principle which must be borne in mind in formulating the syllabus is that it should aim not merely at imparting knowledge but at developing certain significant social, intellectual and moral attitudes which distinguish a truly educated person from an uneducated person. These attitudes are, no doubt, largely the outgrowth of the child's home and school life in which the personality of the teachers and the parents as well as the methods of work adopted play a dominant role. But the contents and the organisation of the curriculum have also considerable influence in shaping his attitude and point of view. The various subjects of the curriculum should, in fact, be interpreted as so many windows through which the child looks at the world. The composite view of the world which he gains through them determines largely his reactions to many of the situations which he comes across in his life. Let us take the teaching of History as an illustration. If the history curriculum is narrow and biased, if it stresses the military and the political aspects only, if it gives more emphasis to the strivings of self-seeking and power-mad individuals than to the achievements of cooperative endeavour or social service, it will produce one type of mind. If, on the other hand, history is presented as a "reasoned account of man's evolution on earth", in which the cooperative effort of individuals and groups has played its part in shaping the destinies of nations, if it gives due weight to the contributions made by various groups and races to the cultural enrichment of mankind, if it values the heroes of peace above the wagons of wars, it will give the children a different version of the process of history. And, if teaching has been practical and effective, not bookish and lifeless, it will help to form their attitudes and outlook, and influence their behaviour accordingly. The same thing applies to practically all other school studies—literature, science, geography, etc. That is why, in its Report, the Zakir Husain Committee—later, referred to as the Committee—has given special attention to the formulation of objectives for all the subjects of the school curriculum. It will be worth the teacher's while to study these objectives carefully and critically. These objectives clearly imply that the purpose of the school curriculum is not merely to impart a certain amount of useful information but to help the children to form certain social and intellectual habits which are necessary to make them active, intelligent, creative, and cooperative citizens. This provides a useful guiding principle in the choice of the material for inclusion.

4. Principles Governing the Choice of the Material

In the choice of the material to be included in the curriculum, the teacher must be guided by several complementary but equally important considerations. First, he should take into account the nature and psychology of the child at various stages of his development, because education cannot be 'child-centred' unless it is based on the spontaneous interests and instinctive tendencies of those who are to be educated. Any attempt

to force subject matter suitable for adults on the children will either defeat the very objective of achieving quick scholastic results, or warp their normal growth and thus cause incalculable psychological damage. In drawing up the detailed syllabus in every subject, the teacher should carefully consider whether the proposed material can be naturally woven into the growing experience and needs of the children. Secondly, the special needs, occupations, geographical features and social traditions of the community must be given due weight. Thus, it is inadvisable to impose a uniform curriculum and syllabus, with identical items of subject matter, over a wide area composed of different vocational and cultural groups. It is, no doubt, necessary to treat certain studies as basic because they are essential for certain utilitarian or cultural reasons and appeal to all human beings as such. But in working out the details of the syllabus and in deciding where the emphasis is to be placed, the differences between rural and urban areas, between culturally advanced and backward groups, between boys and girls, between agricultural and industrial people should not be ignored. Such variety and elasticity are necessary in the interest of the groups as well as individuals who are differently gifted and cannot, therefore, all be forced into the same mould. In the Basic curriculum, drawn up by the Committee, certain fundamental things have been stressed but enough freedom is allowed in filling up the details of the picture according to local needs. This is evident, for example, in the recommendations made about the introduction of Basic crafts in schools, which are to be determined primarily with reference to the existing social and vocational situation of the area concerned.

In the third place, as indicated above, the curriculum as well as the syllabus in each subject will be influenced considerably by our educational ideology, our conception of the type of human beings we want to produce in our schools and the aptitudes we want to inculcate in them. The Committee has made it clear that the new schools that it envisages should try to produce men and women who are active, cooperative, possessed of initiative and a keen social sense and generally wedded to the ideal of non-violence which implies respect for one's own as well as others' individuality. The curriculum in history, literature and science is specially important in this connection. History shapes one's view of the relation of self to the group as a whole and of the group to its past and future and thus it is, in a sense, the foundation of a true sense of responsibility towards great objectives and ideals. Put more concretely, it means that the study of history should make the pupil realise that the entire wealth of culture and the resources of civilisation around him are the cumulative result of the cooperative effort of past generations and if in his particular field, he fails to participate actively and honestly in this great historic process—which has given us Science and Philosophy, Art and Architecture, Poetry and Crafts, Machines and innumerable other things—he will hinder the progress of the race, and his own life will lose all purpose and meaning. Literature is a record of the hopes and ideals, the despair and failures, the sufferings and triumphs of individuals and groups—as this great human drama of sunshine and shadows has been visualised and interpreted by some of its great creative spirits. Its study should, therefore, tend to make man more *humane*—that is, wider in his sympathies, more tolerant in his judgements, more active in the pursuit of great, collective purposes. Literature which does not in this way stir the emotions powerfully and call the nobler sentiments into play has obviously failed to fulfil its function. Science, likewise, shows how the mind of man, striving against obstinate and power-

ful natural forces, has gradually triumphed over them and harnessed them to the service of human purposes. It also shows how all progress in scientific knowledge, on which the distinctive nature of modern civilisation depends, rests on the cumulative labours of numerous individuals who were generally unaware of one another's work but strove persistently and often selflessly to extend the boundaries of human knowledge. Rightly taught, it should give man a sense of self-confidence and a feeling of reasoned optimism and enable him to break the bonds of fear and superstition. In reviewing the science curriculum, and in defining its methods of teaching, sufficient stress should be laid on these great moral and intellectual possibilities implicit in its teaching.

Fourthly, it is essential that the curriculum should be so organised that it respects the unity and coherence of the human mind and does not tend to disrupt it by the introduction of many unrelated and miscellaneous items. The present curriculum is crowded with far too many "subjects", each being treated as an isolated unit and consequently taught without reference to other subjects. This is partly due to the fact that from time to time, the claims of new subjects have been pressed by their specialist advocates and, as the claims appeared to be quite plausible, they were somehow accommodated in the curriculum to the great mental confusion of students and the dismay of their parents. It is necessary to introduce some principle of simplification in the scheme of the curriculum out of respect to the unity of the child's mind which is apt to be disrupted by the traditional arrangement of school subjects.

5. The Principle of Correlation

During recent decades many schemes for the better organisation of the curriculum have been tried. The Project Method is one such attempt. It tries to subordinate the process of acquiring knowledge to the carrying out of certain activities or plans or "projects" generally of a practical nature. Pupils select purposeful projects, having educative significance, in consultation with their teachers and one another, e.g., a banking project or a house building project or a national week project. In order to carry it to a successful conclusion, they require various kinds of information, pertaining to history, geography, science, arithmetic, etc. Thus a "learning situation" is created, the process of learning becomes motivated and purposeful and, as it is related to a centre, it is more coherent and meaningful. Various other methods of coordination and correlation of subjects have been worked out by educationists in order to relate different studies intelligently with one another.

The framers of the Basic syllabus were also faced with this problem and, profiting from the experience of other workers in the field, they have tried to make the syllabus more coherent by organising it round three centres : the child's physical environment, the child's social environment and the child's craft work. These three centres are quite obviously the most reasonable fact around which the curriculum can be built up. From the very outset of his life, the child is surrounded by the world of physical forces and phenomena and, in order to organise his activities effectively, it is his first business to get to know his physical environment and to adjust himself to its laws and conditions. Hence, one section of the curriculum naturally concerns itself with the study of the physical environment and aims at giving the child not only knowledge but a proper orientation

towards it. His school education should enable him to *understand* the broad and significant features of the physical world surrounding him and the laws that govern its phenomena, to *appreciate* the beauty of the natural world and respond to its aesthetic appeal, and to *utilise* some of its important forces for his purposes. Thus the child's adjustment to his physical world requires that his mind and feelings and will should all be attuned to it properly. A simple illustration will make the meaning clear. Imagine a child living in a village situated by the side of a stream. How is this stream part of his geographical environment ? What does adjustment to this particular aspect of the environment imply ? What can the school do in this connection ? In the first place, the child should understand what a river is, how it is gradually formed, how the direction of its flow is determined and what happens to it in the course of its journey to the sea. This may be called the adjustment of knowledge. Then, the child should be able, through the cultivation and encouragement of his aesthetic sense, to enjoy and appreciate its beauty as it flows smoothly, slowly and drowsily through the plain or rapidly and tempestuously through the hills and rushes down the slopes. He should watch with pleasure the play of the rays of the setting sun as they transform its surface into burnished silver, and be able to express his feeling of joy in various appropriate ways. This is the adjustment of emotions. Thirdly, he should be able to utilise it, to exploit its possibilities and resources, to use it, to some extent, as an instrument for the achievement of his purpose. In this case it would imply, for instance, a capacity to be at home in water-to-swim across the river ; to know its various uses and functions as a source of irrigation and a method of natural drainage ; to be able to turn its water into the fields for irrigation. This is the adjustment of action. These three processes should really go on side by side. Now, any educational curriculum which attends to only one of these three aspects is obviously one-sided and defective. In most of our ordinary schools, the curriculum is usually "academic"—that is, aiming mainly at the imparting of information, and not an activity curriculum whose object is to produce balanced and capable human beings who can do useful things successfully. So far as feeding and educating the emotions is concerned, it is often not even conscious of the need.

Let us look at these three centres of correlation one by one. One broad section of the curriculum covers General Science which together with the scientific portion of Geography, deals with the physical environment. A careful study of the details of the General Science syllabus will show that in several important respects it differs from the existing syllabuses used in schools. They are confined generally to the study of Physics and Chemistry ; while this one is alive to the great cultural and human importance of the study of Biology which deals with living organisms. In this way, it is more comprehensive and gives the children a better insight into the world in which they are living—a world which is not merely the resultant of physico-chemical forces but in which the miracle of life, of growth, is a basic factor of great significance. Moreover, it includes essential knowledge about hygiene, first-aid, simple astronomy and other everyday phenomena. Secondly, it does not aim at giving children an elementary but systematic knowledge of several separate sciences—Physics, Chemistry, Botany, Zoology and Astronomy. That would be neither desirable nor feasible as it will confuse their minds with too many details and tend to anticipate the mental stage at which they can appreciate and understand systematic, logically organised knowledge.

In order to avoid this overcrowding and confusion and respect the interrelationship of various "subjects" and their relation to life, a different method of approach has been advocated. Actual objects found in the environment and problems connected with them have been made—and should made—the starting point of teaching water, air, fire, seasons, life of plants and birds, elements of food, stars, health problems, and the knowledge of Physics, Chemistry, Biology, Astronomy, Geography, has been woven around them so that each falls into its proper place as a means of explaining the world and its interesting phenomena to the child. Thus the various subjects become related to one another as well as to some concrete objects or phenomena. This is now a fairly generally accepted method of approach in all progressive schools, though unfortunately it still appears as unduly revolutionary to most textbook ridden teachers of Science! But if science teaching is to achieve its dual objective of making an intelligent presentation of the physical environment to the child and of training him—to the extent that it is possible at this stage—in scientific method, it must be reorganised on these lines and become an active and dynamic process.

The second section of the curriculum, which deals with *the social environment* of the child has been broadly designated as "Social Studies." It aims at the presentation, to the child, of the world of human affairs and institutions—the world not as it has been *given* to man but as it has been *made* by him through his work and creative endeavour. This section of the curriculum which covers the ground usually associated with history, geography, and civics adjusts the child, on the one hand, to his environment in space—which is the special province of Geography—and, on the other hand, to his environment in time, which is the field of History. Thus, one aspect of the course in Social Studies enables the child to understand the interaction of groups living under different kinds of geographical environment and developing their own characteristic ways of life and work-from the primitive inhabitants of the frozen North to, say, the highly civilised peoples of Western Europe. Another aspect gives him an understanding of the process of historical development and how mankind has gradually evolved all its complicated socio-economic and cultural life. The creation of this "historic sense"—which is the basis (as I have suggested) of reasoned optimism about the future and of a feeling of personal responsibility to the social whole—is an essential element in a truly educated mind. Civics—or the study of problems pertaining to citizenship in a modern state—gives an understanding of present-day problems and of the individual's rights and obligations, and helps to develop certain moral and social attitudes which are essential for the successful functioning of group life. Obviously, the imparting of necessary information about such social institutions is not enough for this purpose. It is through the methods of work and training used in school that children can learn the requisite attitudes. It should also be clearly understood that "Social Studies" is not just an omnibus title for the three separate subjects of history, geography and civics, trying hospitably to include all their traditional subject matter under one head! It really indicates an attempt to look at the problem from a new angle—namely, how can we best adjust the child to his growing social world, and what is the material which will help him most effectively to interpret and assimilate this world properly! It gives us a new and effective principle of selection and coordination which we should bear in mind in working out the detailed syllabus of Social Studies. The teacher of this subject

has, therefore, a very important responsibility. He must be widely read, have varied interests and be responsive to the appeal of all important social and human problems. He must have the capacity for discrimination so that he may choose wisely from the almost inexhaustible material at his disposal. He needs primarily *not* the academic or the scholastic mind but the capacity to interest the children in what they are learning and relating it to modern life and its problems. He should so orient his teaching that the active acquisition of knowledge relating to Social Studies will help to develop in the children attitudes which we specially value in our educational ideology—cooperation, fellow-feeling, peace-mindedness, belief in the significance of human effort and freedom from narrow prejudice. This may possibly read like a catalogue of all the virtues but some of these qualities are really necessary if the teacher of Social Studies is to make his mark. No other section of the curriculum can do more to instil in the young the virtues of tolerance, cooperation, breadth of vision and genuine humanity. It is necessary in this connection to emphasise again that the mere imparting of relevant facts will not transform attitudes ; it is the reorganisation of the entire programme of the school—curriculum, methods, discipline, social life—in this light which can, slowly but surely, modify children's disposition and values.

Thirdly, we come to Craft which may perhaps be best understood as an intermediary between the physical and the social environment, because it utilises the resources of the former (e.g., wood or cotton or leather or land) for the purposes of the latter, e.g., production of furniture or clothes or shoes or agricultural crops which are required for human use. Now, the question naturally arises : What is the position of Crafts in the curriculum of a Basic school which aims at presenting only the essentials of knowledge and activity to the children ? To many orthodox teachers., addicted to book teaching and inclined to regard education as synonymous with the acquisition of academic knowledge, the introduction of Crafts into the curriculum appeared an intrusion ; making it central or basic to the whole scheme of education was almost regarded as a sacrilege, a dishonour to the temple of learning ! But, if we ponder, with an unprejudiced mind, over the natural inclination and instincts of childhood as well as the nature of the work carried on in the modern world—and these are, after all, the two determining poles of the educative process—the case for the introduction of Crafts appears to be overwhelmingly strong. As I have already stated, the child is naturally active and practical, always wanting to do things and learning most effectively through the process of doing. The world is a world of practical activities, in which perhaps more than eighty per cent of the work is practical—making of things and objects, utilisation of natural resources for social or individual ends, laying the purposeful impress of the mind over matter in a variety of ways. Is it not strange, then, that the process of training active and practical children for an active and practical world should be a largely theoretical academic process, leading to passivity and preoccupation with symbols which are not even pale shadows of reality ? The case for the education of children through craft work is put with great force and cogency by the Zakir Husain Committee and its remarks will bear repetition :

"Modern educational thought is practically unanimous in commending the idea of educating children through some suitable form of productive work. This method is considered to be the most effective approach to the problem of providing an integral all sided education.

"Psychologically, it is desirable, because it relieves the child from the tyranny of a purely academic and theoretical instruction against which its active nature is always making a healthy protest. It balances the intellectual and practical elements of experience, and may be made an instrument of educating the body and the mind in coordination. The child acquires not the superficial literacy which implies, often without warrant, a capacity to read the printed page, but the far more important capacity of using the hand and intelligence for some constructive purpose. This, if we may be permitted to use the expression, is the literacy of the whole personality.

"Socially considered, the introduction of such practical productive work in education, to be participated in by all the children of the nation, will tend to break down the existing barriers of prejudice between manual and intellectual workers, harmful alike for both. It will also cultivate in the only possible way a true sense of the dignity of labour and of human solidarity—an ethical and moral gain of incalculable significance.

"Economically considered, if the scheme is carried out intelligently and efficiently, it will increase the productive capacity of our workers and also enable them to utilise their leisure advantageously.

"From the strictly educational point of view, greater concreteness and reality can be given to the knowledge acquired by children by making some significant craft the basis of education. Knowledge will thus become related to life, and its various aspects will be correlated with one another."

The craft idea is generally recognised as being in some ways the most distinctive contribution of the Basic Scheme, as envisaged by Mahatma Gandhi, to the question of the curriculum. While educationists during the last few decades, have theoretically recognised the importance of practical and productive work, and in many progressive schools the idea has been partially put into practice,—e.g., schools run on the Project Method, "new schools" in the West, some of the children's schools inspired by the influence of Froebel and Montessori—it is to the credit of the Basic Scheme that it has boldly admitted the full claims of craft work and given it the central place in the curriculum that it deserves. The half-hearted introduction of handwork or manual training as a "subject" would not have met the object in view. This has been tried in the past but it has had no vital effect on the nature of education because it was looked upon as an "extra" and not woven into the curriculum as an integral part. The result was that, at best, it gave pupils a little training of the hand and the eye but left the rest of the curriculum and the methods of teaching untouched. Under the new scheme of education, the teaching of some craft is made the centre of education and the other subjects of the curriculum are integrally related to it, thus providing a natural and effective method of co-ordination amongst them. Moreover, the craft is not to be taught mechanically as merely a means of manual training but "the why and the wherefore" of the processes involved, and its larger significance and relationship to life are to be made clear to the children. Thus, craft work will be illumined with meaning and its underlying technique—of activity, investigation, resourcefulness, fitting of means to ends, respect for work—will also flow over into the rest of the curriculum. It is in this spirit that the introduction of Crafts into our schools has been advocated, and it is only when this spirit inspires teaching that New Education can become

an instrument for inculcating a new mentality and a new social and practical outlook in our children. Otherwise, it is idle to expect that it will, by itself, cure unemployment or lead to a more just or rational organisation of the social order.

Thus it will be seen that Social Studies, General Science and Crafts form the basic nucleii of the curriculum. But there are other "instrumental" subjects which are as important. Amongst these pride of place must be given to the mother-tongue which is both an instrument for the expression and communication of ideas and acquisition of useful knowledge and a subject of intrinsic cultural importance. Unless the mother-tongue is properly mastered, it is impossible to grasp ideas with lucidity and intelligenee or to share in the literary and cultural heritage of one's people. one of the gravest defects of our curriculum has been the failure to give sufficient importance to it in schools and colleges with the result that students are generally ill-educated and unable to express themselves fluently and clearly. It is for this reason that special emphasis has been placed on the mother-tongue in the Basic curriculum. Throughout the Basic school it is to be used as the medium of instruction, so that by the end of this period it becomes for the child a pliable instrument of speech and writing and study, and he is able to read its prose and poetry with understanding and enjoyment.

Drawing is another medium of self-expression—like speech and writing —which has both aesthetic and utilitarian value. Children delight in expressing their ideas and feelings through apparently crude but highly individualised drawings and, if they are intelligently and tactfully guided, they gradually acquire appreciation of form and their expression becomes disciplined. If a certain amount of proficiency is attained in it, drawing continues to be a source of pleasure in after life also. Moreover, in connection with the learning of many other subjects—history, geography, mathematics, science—it is an invaluable aid and the teachers who can draw well can make their explanation clearer and enlist their pupils' interest more easily. Likewise, boys who acquire skill in drawing, often find their work in other subjects made pleasanter and easier. In later life, in many professions both scientific and artisan, the capacity to draw well and accurately is a great asset. For all these reasons,—immediate and remote, cultural and utilitarian—drawing must occupy a significant place in any well conceived scheme of curriculum. But in the Basic curriculum, which is built up round the nucleus of some productive and ducative craft, its importance is even greater, for in most crafts—e.g. agriculture, woodwork, weaving—the making of plans and designs involves some knowledge of drawing. In fact, the intelligent and progressive practice of a craft like woodwork is impossible without the capacity to draw. It is, however, necessary that the teaching of drawing should be closely correlated with the Basic craft as well as other subjects and the objects or scenes to be drawn should generally be suggested by the home or school environment and the occupations of the children. This does not, of course, rule out "imaginative" drawing but stresses a general principle of great importance.

A knowledge of mathematics to the extent that it is a necessary factor in our everyday life is, obviously, an essential part of any curriculum. Its utilitarian value in the daily routine of life and in the study of natural sciences is too well known to need elaboration. In the practice of the

Basic crafts also, whether it is agriculture or spinning or weaving or wood work or anything else, it is necessary at every step to make arithmetical calculations or understand geometrical figures. Every child should be able, by the time he completes the Basic course, to work out the ordinary calculations required in the course of his craft work or his personal and community concerns and activities. He should also have a practical and clear recognition of various geometrical forms to the extent that he is likely to come across them and to calculate areas and volumes. But the justification for the introduction of mathematics does not rest on its utilitarian value alone; it is equally important for certain cultural and intellectual reasons; it insists upon accuracy and exactitude and gives the children practice in carrying through a closely-knit logical argument with reference to certain types of abstract or concrete problems.

The introduction of Hindi as a second language in non-Hindi speaking areas is another very important and far-reaching step which was first proposed in the Basic Scheme, although, at the time, the name favoured for this common language was Hindustani. So long as education was confined to a small class of people who looked forward to college education and regarded politics and the services to be their close preserve, English served as a means of inter-provincial communication, a kind of *ligua franca* for the educated classes. The exaggerated importance given to it in the schools and colleges was open to many objections on educational, psychological and political grounds but there is no doubt that, in the absence of any other common language, it did fulfil a necessary function. Now, however, when the question of universal education is being seriously tackled and political freedom has been achieved, English cannot obviously serve as the medium for the commerce of ideas amongst people—belonging to various linguistic areas, classes and communities. It is necessary to have a suitable *lingua franca*, and the claim of Hindi—the common language generally spoken by the vast majority of people in Northern India has been accepted for this purpose. In order to facilitate the process of national solidarity, it is necessary to teach Hindi as a compulsory language, without minimising, of course, the importance of the other national languages which should be developed to their fullest extent and serve as the media of everyday business as well as cultural expresssion in their respective regions. It is only short-sighted provincialism which sets up a controversy between the complementary claims of the provincial languages and the official language. It should be the duty of our new generation of teachers to induce in their pupils a love of their mother-tongue as well as a sense of loyalty to the common language of the country. By doing so, they will be rendering an educational as well as a national service of great magnitude.

I have attempted to give a brief but comprehensive idea of the principles which underlie the Basic curriculum, and incidentally, the whole concept of Basic education. Let me try and sum up its significant features. It attempts to adjust the growing child to his environment and to exploit its resources for educative purposes. It makes the child's early, undifferentiated but active, rich and practical experiences its starting point, links them up with one another, gradually introduces order, system and meaning into them and bridges the gulf between concrete experiences and book knowledge. It is an "activity" curriculum, not confining its outlook to the imparting of information about certain subjects but seeking to encourage various kinds of activities through which the child acquires know-

ledge and also develops certain significant social, intellectual and moral attitudes. It stresses the principles of coordination and correlation and instead of introducing a large number of isolated "subjects," it seeks to combine those which naturally "belong together", into fields of knowledge like Social Studies and General Science. Moreover, in drawing up the syllabus in each subject, it seeks to organise the essential subject matter into a number of significant and comprehensive units which are not cut off from life but closely related to it. In science, for example, it prefers to study such concrete everyday topics as water, fire, air, food, the human body, which bring the various sciences into intelligible relationship, rather than abstract scientific laws, logically arranged according to the needs of the educated adult mind. It gives to craft its overdue but essential place in the curriculum and attempts to provide coordinated training of the hand and the mind. Thus, by basing itself on the psychology of the child mind on the one hand and the sociological requirements of community on the other, it aims at bringing about a far-reaching and desirable revolution in the education imparted to children in our schools.

There is, however, one thing which we should always bear in mind. No curriculum is sacrosanct and no items included in the syllabuses are unchangeable. The curriculum is meant to reflect the pattern of life—a carefully selected pattern—and since life itself is changing and its needs as well as values have to be examined and assessed from time to time, the curriculum cannot possibly be regarded as immutable. This responsiveness to change should not only characterise educational authorities responsible for the framing of curricula and syllabuses but also the teachers who are to translate them into schoolroom lessons, assignments and activities. The point of departure should always be the growing child in his characteristic and dynamic environment and the teacher should refer back to him at every step—to him, and to the values and ideals which education and the community in general cherish. The endeavour should be to help him to acquire useful knowledge, skills and attitudes which will enable him to live a life that would be worthy both from the individual and social point of view.

CHAPTER II

CORRELATION

Meaning of Correlation in Relation to Basic Education

Educationists are agreed that there should be correlation of different branches of knowledge in the education of young children. In Basic education, however the centre of correlation is activities pertaining to the basic craft and subsidiary crafts e.g., agriculture, woodwork, weaving etc. or in other words, projects calculated to make the students go through aseries of experiences regarding the basic needs of life, namely, food, shelter and clothing.

How the Technique of Correlation is Practised

The sponsors of Basic education stress the necessity of making all educational activity centre around concrete situations of life, especially those related to productive work.

With this end in view, craft is selected for the school, bearing in mind the educational possibilities inherent in it as well as its importance in the life of the community. In his daily teaching programme, the teacher takes two or three periods ranging roughly from one and a half to two hours during which he attempts the direct type of correlation in the course of the activity itself, that is, he helps children to acquire all the information that is absolutely necessary for the continuance of the activity.

For example, the students, engaged in gardening should be informed of the ratio in which clay and manure should be mixed while sowing seeds in flowerpots. They should also be told, how deep the seeds are to be sown and whether the flower pot is to be placed in the open or in the shade.

In woodwork, similarly, the students should know how to distinguish between seasoned and unseasoned wood, as also between various kinds of timber. A sketch plan is to be made, measurements taken and arithmetical calculations done, for the timber required.

These are some of the types of correlation, which the teacher attempts while a particular activity is in progress. He utilises every opportunity in teaching his students 'the why and wherefore' of the actual processes involved in an activity. The students are also required to make a note of the quantity of the raw material consumed and the rate of progress made in the form of graphs and charts.

The work-periods are then followed by periods earmarked in the time-table for the mother tongue, art, arithmetic, social studies, nd general sci nce. The problems that may have arisen are dealt with by the teacher in the relevant periods. In the arithmetic period, the cost of articles prepared and other allied problems may be worked out. In the geography period, the teach r may discuss the sources of the raw materials used in

the activity. For example, in grade (*vi*) where the basic craft is weaving, the students may be profitably taught the history of weaving and point out that weaving as a craft has been practised in our country from time immemorial. The cultivation of cotton in various parts of the country may be studied. The amount of yarn needed for weaving cloth of a given size may be calculated.

Suggested Correlations with Crafts

A few examples of correlation between the craft and various school subjects are suggested below. (Obviously these cannot be exhaustive). They are intended to provide some guidance to the teacher

Gardening and Agriculture

Note :—Instruction in this subject for the first five years should be given through observation mainly. The students should be conversant with the fundamental principles of soil management and plant growth. Actual work on the demonstration plots should supplement observation. The students should use 'Khurpies', watering cans, and other small tools which they can easily and safely handle.

Grades i and ii

Observations :—

I. Visits to village fields and gardens :—

(*a*) to observe farmers at work.

(*b*) to observe vegetables, fruits, and flowers growing in different seasons.

(*c*) to observe weeds and to make their effects on crop growth.

II. Excursions to places of local interest, particularly those of natural beauty and historical importance, to observe the general lay-out of the countryside, of soil, of means of irrigation used etc.

III. Visits to local markets (1) to learn about vegetables and crops that are grown locally and those that are brought from outside, (2) to learn about vegetables and fruits available in different seasons.

Practical

Sowing seeds :—Preparation of small seed beds, digging, manuring and 'Khurpi' work, watering, weeding and picking insects. When and how to weed. How to dispose of weeds.

Correlation

(Nature Study and General Science)

Excursions into the surrounding country can be utilised to teach (i) How plants develop from seeds ; What plants need for their growth :— Soil, water, food, light, air, and shelter. (*ii*) What animals need for their growth :—food, shelter, clothing, air, light, water, etc.

(*iii*) Birds and animals in the neighbourhood.

(*iv*) Identifying a few plants; collection of flowers, seeds, leaves.

Social Studies

A good deal of information can be given in the course of outings regarding the directions, seasons, rivers, hills, rains etc. Visits to historical places can be correlated with the biographies of historical persons. While observing farmers at work, the teacher can impart information regarding the primitive man, how he lived, his shelter-caves, trees etc, how he obtained his food, the tools he used; beginnings of agriculture.

Mathematics

The students can lay out the beds in the garden in geometrical patterns. Observation of plots will introduce the students to such geometrical patterns as rectangles, squares, triangles, etc. He will also have a concrete idea of the measures of weights such as 'Tolas' ,'Chattaks' 'Seers' etc., when he weighs out seeds and manure for these plots.

Language

The child may be asked to write about his observations and experiences. This will improve his speech as well as his writing.

Habits

General care of the garden as well as of the tools used will help create a sense of responsibility in the students.

GRADES III AND IV

Observations :—

As in Grades I and II, but with more detail.

Note :—The pupils should be able now to work with small sized spades, *Kudalies*, *Khurpas* and other tools. All the work in the flower and vegetable garden should be performed by them.

1. To visit village fields and vegetable gardens.
2. To observe weeds and their effect on crop growth.
3. To compare growth of plants under different conditions e.g. differences in the amount of water, air, sun, etc.
4. To observe the difference in the growth of plants in vegetable plots with manure and without manure.
5. To observe the difference between a root and a stem. To study stems, buds, branches and leaves.
6. To differentiate between groups of field crops according to the time of sowing—'Rabi' and 'Kharif'.
7. To study soil-formation.
8. To study the nature of manure and its functions. The value of night soil as manure.

Correlation

Nature Study :

Observation of birds and insects which visit the crops. The life story of a grass-hopper, a butterfly, etc.

General Science :

Amount of water, air, sun, manure required for the growth of plants. The need of water, air, sun, and food for the growth of all living things. The effect of the four seasons on the plant life. How a plant grows. Functions of the different parts of a plant. Preparing a planting calendar. Identification of plants, weeds, and insects.

Geography :

Study of soil and its formation. The agencies which bring about the tearing of rocks. The cycle of seasons. Vegetables and fruits available in different seasons.

Arithmetic :

Marketing, weighing, and grading of products leads to the teaching of the four fundamental rules—simple and compound.

Language :

Written records of the observations made and of the work done will improve the expression of the child. Composition work and letter-writing may be introduced by inducing the child to describe his activities in the vegetable garden or the process of growth of a particular corp or plant. This may be done in the form of an essay or a letter written to a friend or a relative.

Grade V

Observations as before but of a more detailed and advanced standard.

1. Laying out of different types of beds for vegetables and flowers. Digging, breaking up soil, manuring, formation of plots.
2. Preparing seed-beds.
3. Transplanting seedlings, spacing, planting, watering etc.
4. Elementary study of different types of soil :—sandy and clayey.
5. Applying manure to beds Care of manure pits.
6. Study of manured *versus* unmanured plots with the same crops and with the same treatment in other respects. Similar experiment with weeded and unweeded plots.
7. Irrigation.
8. Study of garden implements, their shape, function and proper use. Comparison between country and iron ploughs.
9. Necessity of weeding. When and how to weed.

10. Study of garden pests and simple methods of preventing insects from damaging vegetables and crops.

CORRELATIONS

Arithmetic :

While planning gardens, beds and paths, child learns surveying, measuring, etc. This will help him to learn the calculation of areas.

Maintaining a farm-account and marketing of the garden produce may be utilised to teach him "Profit and Loss" and "Practice".

Geography :

Watering the plants will provide the teacher with a situation in which to tell his students about different methods of irrigation in India, canals, tanks, tube-wells, etc. The rivers—their sources and their routes—may also be explained.

General Science :

The following topics can be taken up :—

Methods of protection of crops from pests and picking off diseased parts of plants.

Care of drinking water, cleanliness of the house, the school and the village.

Civics :

A Civic sense may be developed in the students by making them responsible for the cleanliness of the farm.

Language :

Record of observations and experiences can form a basis for self-expressional work—oral and written.

GRADES VI AND VII

1. Cultivation of a field crop, such as wheat, barley, grain, cotton, etc. Effects of deep and shallow ploughing.
2. Control of pests and destruction of harmful insects.
3. Care of animals—better housing, cleanliness, proper feeding, etc.
4. Common cattle diseases and their treatment.
5. Preserving fruits, vegetables and good seeds.
6. Surveying, planning, and measuring plots.
7. Detailed study of field and garden crops.
8. Exhalation of Oxygen from leaves.
9. Nutrition.

10. Keeping farm-accounts and records.
11. Care of tools and simple repairs.
12. Marketing.
13. Growing of crops of more than one kind.
14. Effect of light on plants, noting difference by growing some plants in the dark and some in the light.
15. Running a cooperative shop in the school.

Correlation

Geography :

A knowledge of crops in different seasons can be made a starting point to acquaint the students with the climate of the locality and the factors that determine that climate. What sort of climate is required for the growth of different crops such as wheat, barley, maize, cotton etc. ? Where do they grow and why ?

Different types of climate can be taken up.

General Science. :

Knowledge about cattle diseases may be imparted. The students may learn the cause and cure of ordinary diseases as also the care and segregation of sick animals.

Interdependence of plant and animal life—plants give out oxygen which animals need, and animals breathe out carbon-dioxide which plants require. Composition of air, and the need of fresh air and nutrition for the growth of human beings, animals, and plants.

Mathematics :

Surveying and measuring of plots. 'Field Work' in geometry.

Running a cooperative shop in the school, and keeping complete accounts of the school farm, 'Interest', 'Profit and Loss', 'Partnership', 'Calendar' and other important rules in arithmetic.

Language :

Records of experiences and work done, combined with the reading of allied literature on gardening and agriculture, afford ample scope for the improvement of skill in the mother-tongue.

Claywork and Pottery, First and Second grade

Activity :

Making small pots of simple shapes. Making models of fruits and vegetables.

Making sun-dried bricks.

Suggested Correlations

Arithmetic :

The child will have a concrete idea of counting, addition, and subtraction while handling clay-beads and bricks. He will also have an idea of different measures of weights such as *Chattaks, Seers, and Maunds*, when he mixes clay with sand in a given ratio for shaping things. An elementary idea of geometrical shapes e.g. cubes, squares and spheres, may be acquired by him when he is engaged in clay-modelling.

Language :

When children are asked to describe the process of making toys, there will be ample scope for the improvement of speech and writing. The teacher can help them to build up their vocabulary about kitchen utensils, animals, birds, and vegetables. He can skilfully weave stories around articles of clay which they either make or observe in their neighbourhood.

Social Studies :

When children are busy making earthen pots, they may be taught about primitive man, how he made his first earthen cup, and provided for his shelter, his clothing, his means of livelihood, etc.

Art Work :

Colouring toys and decorating clay pots may develop the finer creative powers of the child. Those designs may then be transferred to paper by the students themselves.

General Science :

Cleanliness of hands, finger-nails, face, head, teeth, and feet. Taking care of claywork tools, cleaning them, and keeping them in proper order.

Other crafts can similarly be utilized for educational purposes. A teacher in a Basic school should not concentrate on books alone—particularly those prescribed by the Department of Education. He must collect suitable reading material from different sources, relevant to the activities in which the students engage themselves at a particular time. He must choose this material with an eye on the mental age and interests of the students concerned.

Forced Correlations

The teacher should be continually on guard against unnatural, superficial, and forced correlations. Experience in some Basic schools, has shown that correlation is sometimes pushed to extremes with very poor results.

Correlation should, therefore, always be natural. It should be borne in mind that the technique of correlation must help in a better understanding of the topic concerned.

An example of artificial correlation is to teach the life of the Eskimo by correlating it with spinning. It is ridiculous to introduce the lesson by bringing out the similarity of snow and cotton in regard to their colour.

The teacher of a Basic school may be warned here against another erroneous practice. If the same processes connected with a craft are repeated every day, the whole activity is reduced to a mechanical dead routine. The interest of the students begins to wane. The teacher should, therefore, organise the craft work in such a way that it is divided into units of purposeful activities. The students should not forget that they are spinning and weaving in order to make a piece of cloth which will be used either for towels or dusters or uniforms, similarly they must know that when they are digging, sowing and watering the plants, they are doing so to raise a finer crop of vegetables. Again, a main activity like gardening or weaving may lead to subsidiary activities such as a visit to a farm or a factory. The teacher should make full use of the situations, arising out of these activities to open up new vistas of knowledge.

Correlation of School Subjects with Other Activities

All the activities used as centres of correlation need not be confined to crafts. They may be social as well as intellectual. By way of illustration, take 'Cleanliness' as an activity which should find a permanent place in the programme of a school. It has immense educational possibilities. Hygiene and care of the body are of interest to every one. In the lower classes, this activity should be confined to practical hygiene e.g. cleaning the teeth, hair, nose, and eyes. This can be elaborated in higher grades, where the children may, apart from personal cleanliness, look around at their environment and keep the school, the streets, the *Mohallas* and the drains of the city clean. In the higher grades, say VI and V11, the students may learn to make soap, for washing themselves and clothes. This may lead them to study common diseases and ailments, from which the people of a particular locality suffer. After an investigation of the causes of malaria, typhoid, cholera, small-pox etc., they should prepare charts and posters to educate the community for adopting preventive measures.

They should also learn about a balanced diet, its ingredients, and their food values. The project of cleanliness, if properly organised, can help to create the right type of social attitudes and habits in the children.

An activity-centred programme has been followed in some of the schools of Jammu and Kashmir State. The outlines of a few activities are given here to illustrate how purposeful activities can provide opportunities for giving children a practical and real education.

(a) Village Survey (Grade V)

Language

History of the Village.

Relics and monuments, if any.

Area of the village.

Population, religion and castes. Occupations of the people. The village craftsmen. Mountain chains. Rivers and streams, their sources, wells, tanks and other sources of water-supply.

Geography :

Crops, fruits, vegetables and other products. Agricultural yield of land per acre. Visit to the village grocer's shop.

Imports and Exports.

Study of roads and paths leading to surrounding villages and the city.

Health and Hygiene :

Facts about the health and sanitation of the village.

Visiting the village medicine man to ascertain the diseases from which the people of the village generally suffer *e.g.* plague, malaria, cholera, typhoid, small-pox etc., their causes and cures.

Environmental cleanliness—Dirt and filth in the village. Ways and means to dispose it of—manure pits, latrines, drains, filling of ponds.

Social Studies :

(*a*) Total number of children of the school-going age.

(*b*) Number of children not receiving any education.

Village Panchayat—its constitution and functions, its achievements.

Arithmetic :

Total area of village land. The average holding of a farmer. Measurement of a maximum and minimum holding of a farmer in *Marlas, Kanals* acres. Calculating agricultural produce per acre.

(*b*) 'TAT' MAKING (GRADE-VII)

Language :

Selection of material, cottage industries *versus* factories. Description of processes of spinning and weaving.

Geography :

Story of *munj*, hemp, choir, jute. Areas of cultivation—climate suited to their growth. Exports. Countries to which exported.

Arithmetic :

Classrooms to be covered with mattings. Cost of production of *tats* of specific size. Time and speed of production. Profit and Loss. Graphs showing progress in the rate of production.

General Science :

Study of plants, their parts. Pollination by insects etc. Effect, heat light, and water.

(c) Making a Relief Model of the map of the State (Grade-IV)

Geography :

Studying geography books to find out :—

(a) The size, population and frontiers of the state.

(b) Rivers and mountain chains, forests, lakes. Locating the highest peaks.

(c) Different routes ; road and rail links.

(d) Location of important towns.

Study of annual rainfall. Maximum and minimum temperature in summer and winter. Rain, snow and dew. Direction of prevailing winds. Changes on the surface of the earth. Weathering of rocks. Changes on the surface of the earth. Changes in the interior of the earth. Earthquakes and erosion.

History :

Life stories of historical persons belonging to the state. Their place of birth, their early education, their achievements. Stories of expedition.

Details about various health resorts. Places of historical and religious significance. Important industries. Main occupations of people.

Arithmetic :

Scale for distances and heights, area and population figures.

(d) Building a Model of a Village House (Grades VI and VII)

A city house a village house.

Fine pieces of architecture in ancient, mediaeval and modern times.

History :

Dwellings of primitive man—caves, huts etc.

Types of architecture in different times and different places.

Geography :

Materials used in low-cost housing—clay, stones, timber, steel, cement etc. How they are manufactured and places where available.

Arithmetic :

Estimates of material and labour.

General Science :

Ventilation and sanitation.

Climatic effect on different kinds of structures.

(e) Book Binding (Grade V)

Social Studies :

How cardboard is made. Uses of cardboard. Obtained from where and at what price. Materials used in book-binding. How *abri* is made. How Egypt and China made their paper. How handpaper is made in our country.

Autobiography of mill-made paper.

Arithmetic :

Weight and measurement of cardboard.

Quantity required for binding a book and the cost thereof.

Measurement of *abri* sheets.

Articles and their quantity required for binding the books of a class.

Estimate of the cost including sewing, cutting, pressing etc.

(*f*) 6. A Village Post Office (Grade V)

Language :

Writing personal and business letters. Use of money order forms, telegraph forms, registration receipts, etc. Stamp collecting as a hobby.

Working of Mobile Post Offices.

Arithmetic :

Rates for Registration, Parcels, and Money Orders. Postal Savings Certificate, and problems of banking related to the above.

Social Studies :

Map showing roads and railways, sea and air routes.

Old and new transport systems.

History of the growth of postal services.

Postage stamps from different countries.

(g) Lay-out of an Orchard

Arithmetic :

Area of the land to be enclosed.

Cost of grass plantation, polings and wire for the surrounding fence.

Nature Study :

List of flowers, their seedlings. Collection of their samples. Lay-out of flower-beds, their measurement.

Making Water Channels

Trees to be planted.

Shady and fruit trees.

Collection of leaves, flowers, and seeds.

Methods of growing flowers, fruits and trees. Planting seasons.

Climate suited to different kinds of plants.

Celebration of Health Weeks, Parents' Day, religious and social festivals, and historical pageants.

It must, however, be emphasised that the varied nature o, activities tends to provide a body of knowledge which is, to say the least haphazard. A good teacher must see to it that the knowledge acquired as a result of a particular activity is consolidated and systematised. He must fi'l in the gaps by dealing with the necessary topics with a view to supplementing the knowledge gained through activities.

CHAPTER III

ORGANISATION OF BASIC SCHOOLS

Basic School : A Self-Administered Self-Governed Unit

Basic education aims at a balanced physical, mental and moral development of the child, development in the sense that, while, becoming economically independent, he is able to contribute significantly to social welfare. An educational programme extending over a period of eight years is envisaged with this end in view. At the successful completion of this eight-year course, a pupil is expected to be skilled in some craft to possess the ability to understand the conditions prevailing in his village and community and the problems facing the nation and the world.

In order to ensure the all-round and well-balanced development of the individuality of the child, the school initiates various occupational, social and other activities, the consummation and successful educational exploitation of which require the school to be organised as a self-administered and self-governed unit. The school should therefore, base itself on the democratic principles of cooperation, mutual dependence and toleration, every member of the school striving, with full devotion and a proper sense of responsibility for the collective development of the school community along with his own.

One of the major objectives of the Basic school is to endeavour, directly or indirectly, to meet the life-needs of the locality in which it is situated. It should, therefore, develop itself as a laboratory for projects aiming at the improvement of its surroundings. In this undertaking, the major part should, of course, be played by the teachers and pupils. A student government should be formed and a Ministry elected for the purpose and the work judiciously divided. The responsibility should not, however, be confined to the teachers and pupils. Parents and school inspectors should lend a helping hand when needed. Apart from the guardians and parents of the students, those local citizens who are interested in education, can also help the school through their constructive suggestions and active cooperation. The Basic school can achieve its objective only through the combined efforts and labour of the pupils, teachers, parents and educational authorities. It is, therefore, the duty of the teachers to secure the cooperation of the local community and of experienced intellectuals while working hard themselves and guiding the children in their charge.

Building the School

For the eight-grade Basic school, there should be at least five classrooms. The remaining three classes can meet in the open, either under the shade of trees or, still better, in the sun, if the weather permits. The area of a classroom should not be less than 600 square feet. There should also be a library-cum-reading room of the same size and an office for the headmaster, a Staff-Room, a stock room and an exhibition room, the last not

less than 360 square feet. Provision should also be made for an assembly hall, with an area of about 1000 square feet. The hall provides the venue for all collective activities of the school such as prayer meetings, meetings of the pupils union, *Bal Sabha* lectures by visitors etc.

It is easier for the Basic school to achieve its objectives if it is a residential institution. It is therefore, desirable to provide hostels for the students and residential quarters for the teachers. There should be no objection, however, if for special reasons, some students are allowed to remain day scholars, provided they attend the school punctually and take part in all its activities. But under no circumstances, should a teacher be allowed to stay outside the school premises. Adequate residential facilities should, therefore, be provided for the resident students and the teachers. At least, two out of the eight teachers should be provided with family quarters. The school should run a common kitchen of which all teachers and students, without exception should be members. All the work of the kitchen should be done by the teachers and students, forming themselves into groups and each group taking its turn. The kitchen, of course, should have a dining hall.

In the construction of the school building, the cooperation of the teachers, the students and the local citizens is necessary. After settling details regarding the building, such as layout plan, direction etc., in consultation with the engineer of the Public Works Department, the actual work of construction should be undertaken by the members of the school family themselves and in doing so, the cooperation of the local citizens and local resources should be fully exploited. Where technical knowledge of architecture is required, the services of local architects and masons should be secured.

The various activities involved in the construction of the school buildings by the school community itself, provide the pupils with opportunities for learning. They acquire, through the help of the teachers and through their own efforts a good deal of knowledge pertaining to various essential fields of study. This apart, the building would cost the school less and the construction be completed within a shorter period of time. What is of still greater value is the sense of "ownness" that the members of the school community inevitably feel towards the school building erected by themselves. In every brick, they see reflected the fruit of their own labour and cooperation that now demands their care and protection.

Repairs to the building should also be collectively carried out in the same way. In short, the principle should be, that while the money comes from the authorities concerned, the labour should come from the school community.

Teachers and Pupils of the Basic School

An eight-grade Basic school needs eight teachers, including the Headmaster.

In order to run the Basic school ideally on sound principles of Basic education, the teachers appointed to the school should be persons who have had their education in Basic schools. Such teachers will have a practical and theoretical knowledge of some crafts. But apart from

this, educated as they are under a system in which all teaching is related to a craft, they themselves will be able to put the system into practice more skilfully than others. Under no circumstances should a teacher who has not at least undergone a course of Basic training be appointed to a Basic school. Post-Basic education and a diploma in Basic teaching should be the minimum qualification of a teacher. If such teachers are not available, those who have completed Basic education and passed their Matriculation or Intermediate or some other equivalent examination and have had a teacher's training, can, however, be recruited, as a temporary measure. In selecting teachers to staff a school, local needs and the crafts and occupations found in the surrounding area should be taken into account. There should be teachers on the staff to teach all the subjects and the crafts introduced into the school.

Apart from mastery over school subjects and skill in crafts, the teacher should also possess qualities of love, sympathy, kindliness and generosity. His views should be progressive and his character above reproach. He should look upon his pupils as his own children and their development should be the supreme goal of his life. He should possess sound health and lead a well-regulated life. His pupils should have faith in him, and be moved to emulate him.

The headmaster is ultimately responsible for the proper execution of all the activities of the school. He should, therefore, be able to secure the cooperation of the teachers, the pupils, the parents and other citizens of the locality. The success of the school will be gauged by the amount of co-operation and sympathetic attention but he is able to enlist in the constructive plans of the school. Besides securing the cooperation of the members of the school and local citizens, he should also take the help, suggestions and guidance of School Inspectors and Supervisors of the Education Department. He must possess sympathetic regard for his colleagues and affection for his pupils and a degree of organising capacity essential to steer the school smoothly along the path of progress.

The student population of the Basic school belongs to the age group 6—14. A pupil enters the school at six and comes out of it after eight years, completing the full course. Sometimes students from the various grades of the traditional schools also seek admission into the Basic school. Such students should be kept in a special class for some time, where they can get a practical and the theoretical grounding in crafts and acquaint themselves, through concrete living, with the philosophy of Basic education. At the end of this period they should be given a test and admitted to the grade for which they are found competent. The strength of a class should not be more than 30 children. The responsibility for the progress of each class should be entrusted to a separate teacher, though, whenever this is necessary he can enlist the help of other teachers in the performance of his duties.

The Land of the School

Land is the first requisite of the Basic school. It provides pupils with the opportunity to learn agriculture, horticulture, vegetable farming etc. The majority of the student population of the Basic school comes from agricultural families. The theoretical and practical knowledge of agriculture these students acquire in the school benefits their families.

Where all aspects of agriculture are sought to be taught and facilities are available, the school should possess ten to 15 acres of land and where only horticulture and vegetable-farming are taught, the school should have, at least, five acres of arable land. Apart from this, there should also be some land where the children can play and take exercise.

The best possible use should be made of whatever land is available to the school. The teachers and pupils should collectively plan the use of the land, keeping in view its fertility and the means available to them. In the execution of the plan also all teachers and pupils should cooperate. Provision should be made for wells, pulleys etc. to irrigate the school land under cultivation.

The Plan of the School and the Education.

To achieve an all-round development of its members, the school plans and initiates suitable activities. Through their activities in the school, the pupils acquire essential knowledge from different subject fields. The plan of the school, aiming at, among other things, the self-sufficiency of the school family, should be framed, keeping in view the individual needs of the members of the school, the conditions of the locality, the means available to the school and the capabilities of the school members. The activities that the school embarks upon, under the plan should be clearly visualised and listed in detail so that each member of the school knows what he has to do, what its purpose is. how much time it will take him and lastly whose cooperation is to be sought. The Plan-frame should also indicate the source of raw materials needed, and the market where the produced goods will find demand.

In the execution of the plan, care should be taken to avoid all waste of time and energy. The expenditure on the execution of the plan and the collection of materials should be the minimum possible. But the labour put in by the members of the school should be properly rewarded. From the point of view of the educational possibilities of the activities, it is extremely important that the members of the school should regularly exchange views and experiences.

The plans for the different grades are made on the basis of the overall plan of the school. They are chalked out by the pupils themselves under the supervision and guidance of the teachers concerned.

Some Important Activities of the School.

(*a*) *Collective Cleaning* :—The work of the Basic school begins with cleanliness. It ensures the physical well-being of the individual as well as of the community. One objective of making cleaning a part of the school activities is to ensure that while keeping themselves, clothes and belongings clean individually, the members of the school collectively keep the school, its compound and surroundings clean. The other and the more important objective is to make cleanliness a part of their lives so that they tolerate nothing that outrages their sense of cleanliness anywhere in life. To achieve these objectives, it is necessary to make cleaning a part of the daily programme of the school. The students should. for the thorough execution of the cleaning programme, be divided into small groups and each group entrusted with the responsibility of cleaning a specified

part. The teachers should also participate actively in this programme. Only locally available materials should be used for cleaning. Brooms, pick-axes, baskets etc. should be produced in the Crafts department of the school and the required raw materials produced, as far as possible, from the neighbouring villages.

Apart from daily programmes of cleaning, special programmes of cleaning should also be organised on special occasions. Once in a while some neighbouring village should be visited and cleaned, in collaboration with the villagers. This, if repeated, will awaken a sense of cleanliness among the village folks who will ultimately take up the work of cleaning the village themselves. In addition to cleaning it is necessary to beautify the school premises. This develops the aesthetic sense of the students and refines their tastes. Here also only locally available things such as flowers, leaves etc., should be used for decoration. The ancient village conception of ornamentation, "alpana" wall-painting, etc, should be developed among the students.

(b) *Improvement and Protection of Health.*

A regular medical check-up of the members of the school community by an efficient medical practitioner is essential to ensure their satisfactory health and its progressive improvement. Every one of them should conscientiously carry out the instructions that the doctor gives them. The Headmaster for his part, should take steps to get his suggestions carried out.

When necessary the parents of students can be contacted. As Weighing is one form of physical evaluation the weight of every pupil should be properly recorded every month. If anybody is found to have lost weight, his diet and style of life should be investiged and the necessary changes made in them. The advice of the school medical officer should also be sought.

In order to improve the health of the students, provision should be made in the school for indigenous games such as *Kabaddi, Chikka,* races etc. A playground is therefore, essential. Particular attention should be paid to regularity in games and exercises. Time for exercise and games should be fixed for each grade by the student in charge of health in consultation with the Headmaster and the physical instructor. The teacher's presence in the playground is essential. It would be still better if the teacher took part in the games. There should also be a ring in the compound, so that those who are specially interested in exercises can improve their health through such exercises as "dand" (Pull-Ups), "*baithak*" etc.

(c) *Community Mess :*—The food for all the members of the school should be cooked at one place and they should dine together. If the school happens to be partly non-residential, the non-resident scholars should at least lunch with their follow-students. Dining together develops in the pupils a social sense and refines it. The mess arrangement should be such that a delicious and balanced diet is provided at the minimum cost. Where a full lunch for all is beyond the means of the school, it can be reduced to a snack lunch. The fruits and vegetables produced in the school garden can be of use for this refreshment. The boys may be permitted if they wish to bring their tiffin from home and supplement it with fruits and vegetables.

supplied by the school. A better arrangement will be to collect the raw materials for refreshment (in the form of grams etc.) once for the whole month and prepare the refreshment in the School itself instead of asking the boys to carry their own refreshment with them daily. Groups of students may cook it in turn under the supervision of the teacher and serve it to their colleagues.

(*d*) *Craft Activities :* Crafts should be organised keeping in view the needs of the school and the neighbourhood. In the school the aim of such activities is to provide the students with opportunities for their development and to make the school as far as possible self-sufficient. Usually the school provides for some crafts like agriculture, horticulture, vegetable-farming, dairy-farming, weaving, leather-work, bee-keeping, etc.

Agriculture, horticulture and vegetable-farming: Where ten to 15 acres of land and facilities for irrigation are available and school members themselves have the know-how, agriculture should be introduced as the basic craft. Here horticulture and vegetable-farming will be subsidiary crafts. Where land is insufficient, fruits like plantains, papaw or lemon and seasonal vegetables may be grown. The land available to the school should be distributed grade-wise, each grade cultivating its own plot of land according to its plan, under the supervision of the teacher. Horticulture and vegetable-farming should be compulsory for every student. In residential schools provision should necessarily be made for dairy-farming. This will provide fresh and pure milk to the school and help it to become self-sufficient.

Clothes are second only to food in importance in our lives. All efforts should be, therefore, made to make the school self-sufficient in this respect also. Collective spinning should be made compulsory even though spinning may not be the basic craft of the school, every member of the school should spin sufficient yarn for making his own clothes. Spinning and weaving are of course to be practised by the pupils in the crafts period, but necessary facilities for spinning or weaving should be provided also to those who want to spin or weave before or after the school hours. A part of the profit thus made after meeting the cost of raw materials, equipment, maintenance etc., should go to the producer. Where the pupil uses his own materials, he should be charged only for maintenance. This will enhance his interest in crafts leading to better progress.

In accordance with the needs of the school and its neighbourhood and the facilities available one of the following should be made the basic craft :—

(*i*) Spinning and Weaving.

(*ii*) Agriculture and dairy-farming.

(*iii*) Wood Metal Work.

(*iv*) Leather work.

(*v*) Tailoring.

For the student to acquire skill in these crafts and to relate school crafts to the social life around them it is necessary that :—

(*i*) The goods produced should be consumed by the school community itself and the neighbouring villages ;

(*ii*) There is a cooperative store and sales department in the school, in the running of which the students have a hand ;

(*iii*) To make the pupils specially efficient in crafts and to widen the scope of the educational possibilities of these crafts, small projects should be launched ;

(*iv*) Contact should be established with efficient craftsmen in the neighbouring villages and their help enlisted.

(*v*) The school functions as a laboratory and through its crafts department helps in the expansion of local cottage industries. This can be done by preparing ideal seeds and fertilizers and distributing them as specimens in the villages, by undertaking agricultural experiments of a moderate size and by introducing improvements in spinning and weaving machines ;

(*vi*) Facilities should be provided by the school to encourage, guide and help pupils, who, on completing their education, want to adopt a particular craft as their means of living ;

(*vii*) cultivation of cotton should be taken up by the school so as to achieve self-sufficiency in clothes and after experimenting with it inside the school, it is propagated in the villages around ; and

(*viii*) to give specialised training to trained and experienced teachers in different crafts, provision should be made in training centres for short training courses ;

(e) *Cultural Activities* :—The "Bal Sabha" or the students union should meet at least once a week. The students should report to the meeting their own individual progress and that of their class as a whole. Lectures, story-reading, drama, dance, etc., should also be organised once in a while. The *Bal Sabha* should at times meet in the neighbouring villages. The villages should take part in such meetings both as visitors and active participants. The active cooperation of the teachers in organising such meetings fills the students with enthusiasm, provided the teachers take care not to dominate the proceedings. The running of the 'Bal Sabha' should be completely in the hands of the students. If a teacher or an outsider wishes to participate in the proceedings of the *Sabha*, he should obtain the permission of the secretary of the *Sabha* to do so. There is a danger to guard against. It often happens that some students take so much interest in cultural activities that backward students are deprived of all opportunity to come forward and improve themselves. The Headmaster should try to encourage such students to participate in the cultural activities of the school.

(f) *Publication of School Paper* :—To lead a successful life today we must know what is happening around us and what the social , economic and cultural importance of these happenings is. Newspapers should, therefore, be provided in the reading room of the school. But not all the pupils have the ability to follow and understand every event nor does the reading room provide so many newspapers as to go the round of all the students. The school should, therefore, have a newspaper of its own. A group of students from the higher grades should be entrusted with collecting important national and international news items from daily papers and information regarding significant events taking place in the neighbouring villages. They should read them out, after editing them to the mass of the students every morning in the school assembly. On special occasions,

special issues of the paper should be brought out. The editing of the special issues also should be done by the students themselves under the guidance of their teachers.

(g) *Self-Study* :—Books on subjects related to various activities proposed in the school curriculum should be recommended, at the time the school plan is made. Pupils acquire knowledge directly from the teachers in the process of carrying out the school activities. But the knowledge so acquired is neither sufficient nor systematic. Students, therefore, have to supplement it through independent self-study under the guidance of their teachers. Each class should be provided with a library of its own. Books for the libraries should be selected by the authorities concerned in consultation with the students and teachers. The books should be entrusted to the charge of the "Siksha Mantri" or the class representative in charge of the academic affairs of the class. The number of books should exceed that of the students in the class so that every student can have at least one book at a time. The student should study the book lent to him within a specified period of time and answer the questions given on the book by the teacher, who should not only correct and evaluate these answers, but also suggest, on their basis, further readings for the student's future independent study. Where there is no provision for class-libraries the pupil should be lent books from the school library. The teacher himself should be given to study, if he is to succeed in enabling his pupils to profit fully from self-study, in maintaining their interest in it and in making it an inseparable part of their lives. The teacher should be previously acquainted with the books the pupils are required to study. It would be better, if he himself reads the books selected for the class first and attaches to each book a list of significant questions based on the contents of the book. On studying the book the student should answer one or more of these questions depending upon the time at his disposal, and submit the answer or answers to the teacher for evaluation and suggestions. This procedure should be invariably adopted with every book and every student.

When collecting books for the library both the teacher and the student should be kept in view, and books useful to both should be acquired. If some costly but useful books prove to be beyond the means of the school, it can join some neighbouring schools in order to buy them. A list of such books meant both for teachers and students, should be prepared and each school should buy some of these books. Then, through a system of exchange, these books should be used by all the schools.

(h) *Weather Chart*—The pupils should regularly observe and study natural phenomena. On the basis of their observation, they should develop a daily weather chart. This should be done under the guidance of the teacher, by groups of boys in turn. The study of the weather chart will prove one of the most effective means of teaching science.

(i) *The organisation of Gram Raksha Dal*—After the educational activities inside the school are over, students will live in the village just as the other citizens. They will produce what they used through their occupational activities and lead a contented life with the fellow-citizens of the village, on a principle of inter-dependence. But in their adult life, they are likely to meet with situations calling for self-defence and protection of their person, their family, neighbourhood, village or nation. The students

should, therefore, get the necessary training for defence in the school itself. This work should be entrusted to a teacher possessing special training in the line. If no such teacher is available on the staff, the Headmaster should contact the higher authorities to appoint a teacher with such training. In the meanwhile, as a temporary measure, the services of somebody from outside should be obtained to organise a *Gram Raksha Dal* (Village Defence Unit) inside the school. The *Dal*, of which every student is compulsorily a member, should train the students in the general principles of drill and parade. The members of the *Dal* should clearly understand the principle "Safety First" and live according to it. They must also possess some grounding in the principles of First-Aid.

(j) *Inter-School Council* :—Basic schools should profit from one another's experience. New experiments are being frequently carried out in the field of Basic education. Teachers with originality and application carry on some experiment or the other, relating to Crafts or other educative programmes of the school. This being so, an organisation is needed to establish coordination between the various experiments being carried out in a given area so that each provides incentive, inspiration and encouragement for the other. An inter-school council can meet this need effectively. Through the council, the schools can also exchange views and materials, and keep themselves informed of each other's progress. Combined gatherings of the students of the member-schools can also be arranged on special occasions. They can also, when found necessary, correspond with one another. This will not only facilitate their work, but also add to their knowledge. Competitions in craft-performance and cultural and literary activities should also be organised in the combined meetings of the students. The Chairman of the inter-school council should be elected from among the Headmasters of member-schools.

(k) *Celebrations of Festivals*—The school should also plan the proper celebration of festivals. Festivals are not occasions for merry-making and revelry. Festivals constitute a respository of our cultural heritage—a heritage still capable of guiding us along the path of progress. The school should also plan the celebration of birth anniversaries of great men, special days and weeks, religious, social and national events and seasonal festivals. The school should be well-decorated on such occasions and proper cultural programmes should be arranged. The educative possibilities of these activities should be fully exploited for the development of both the teachers and students.

(l) *Relations with Governmental and Non-governmental Organisations and Departments* :—Numerous governmental and non-governmental organisations are today working for the welfare of the Community. The school should establish relations of mutual cooperation and assistance with them. Along with this, the school should also keep in touch with government departments that have direct relations with the life of the people. Such contact is essential for the school to procure, if needed, immediate help from the Health, and Social Welfare Departments of the Governments.

(m) *School Exhibition* : The school should have a permanent exhibition room to display its achievements in craft work and literary activities. Specimens of all that has been produced by the school should be attractively exhibited here. Special exhibitions should also be organised at times.

Parents and guardians of the school should be specially invited on such occasions. They will be delighted to witness the rewards of the creative activities of their wards. Their sympathy and good wishes for the school will be further enhanced, ensuring their earnest cooperation with the work of the school. Exhibitions on a larger scale should also be sometimes organised under the auspices of the Inter-School Council.

(n) *Entertainment of Guests and Talks by Visitors:* The School should have arrangements for the proper welcome of visitors, and for their stay in the school. If the guest happens to be gifted in any way, members of the school should make use of his visit by organising talks, discussions, music recitals, dance performances etc.

(o) *Basic School and Public Contact :*The Basic school should help in reconstructing society. For this, it is essential to establish a living contact between the school and society. The Headmaster and the members of the staff should, therefore, endeavour to procure the fullest cooperation of the people in the administration and organisation of the school. These people should be invited by the school to discuss problems concerning the progress of the school. Parents' Days should also be occasionally organised. On such days cultural programmes should be organised with items such as drama, recital of poems and songs etc. through which the students can display their capabilities and achievements.

Besides bringing the community into the school, the school should also go out to the community. The activities of the school can be of no real value, until they reach every household in the village. The cleaning programme of the school, its cultural and craft activities etc., should be propagated and broadcast in the village. The members of the school will have to go frequently to the village to work among the villagers. They will also have to make arrangements for exhibitions, and other means of propoganda. Cleaning, distribution of medicines, cultural activities, etc. can be organised in the village through the school. The school can also help to establish the library, reading-room, social education centre, gymnasium, etc. in the village. In all these, the fullest cooperation of the villagers should be secured. Gradually such an atmosphere should be created that the villagers take into their own hands the carrying out of all these activities.

(p) *Teachers' Council :* Every Basic school should have a Teachers' Council. The Secretary of the Council should be elected by the teachers themselves. The Headmaster should usually be President of the Council. The function of the Council is to plan for the progress of the school and to evaluate occasionally the advance made in the working of the plan. Should the need arise the council can also make changes in the plan. It is also the responsibility of this Council to establish coordination in the work of the members of the staff. Whatever work is undertaken by the school should have the prior approval of the Council so that each teacher regards himself as directly and personally responsible for the thorough execution of the work.

(q) *Preparation of Literature :* Members of the school record in their "Progress Books" the knowledge and experience they acquire from their various activities in the school. They also present dramas, poems, stories etc. during their cultural activities. At the beginning they are borrowed

from other sources. But gradually literary productions by the students themselves should be encouraged, starting, of course, with students belonging to the higher classes. These students should collect and also write lessons for students of the lower classes. In this, they should be guided by the teachers who should set them models by selecting and writing lessons, notes on lessons, preparing reports on progress, etc. themselves and presenting these things in presence of the students. Efforts should also be made to produce suitable literature when issuing special numbers of the school paper.

(r) *Evaluation of Progress and Promotion:*—The annual plan of the school should be made on the basis of the courses of study and conversely that of the different grades on the basis of the overall plan of the school. To cover the whole programme of study for the grade should be the criterion of the plan. The craft and social activities and activities relating to the natural suroundings of the school undertaken by it should be evaluated daily in the order in which they are undertaken. The system of evaluation should be such that the students can easily detect the defects and merits of their work. This will enable them to correct and improve themselves easily. The programme of *self-study* for each class should also be evaluated, as it is being completed in parts. Apart from these, there should be weekly, monthly, quarterly, half-yearly and annual programmes of evaluation. The pupil must be able to know after every evaluation, how far the class as a whole has been successful in carrying out its plan and what his position is as compared to the other members of the class. In the annual evaluation, the average achievement of pupils in the periodical evaluations preceding it, is calculated. A final test at the time also can be given. Promotion to the higher grade is given, if the average achievement in all the periodical tests and the achievement in the final test are satisfactory. The Headmaster, however, should have the discretion of promoting any pupil, even though he has failed to show satisfactory results, provided he is convinced that this failure has been due to adverse circumstances and that he will show better results in future. To supervise the programmes of evaluation in Basic schools and to give necessary suggestions and guidance, the Education Department should set up a committee of experts.

(s) *Daily Programme of the School :*—The daily programme of a residential Basic school where the teachers and students live like members of a single family should cover the 24 hours of the day. A non-residential Basic school should work from 7 A.M. to 11 A.M. in the morning and from 3 P.M. to 5 P.M. in the evening. Alterations, of course, can be made in this time schedule according to local conditions and seasonal changes.

The work of the school should begin with the school assembly. Individual and collective cleaning should find a proper place in the school programme. It is essential to devote two to two and a half hours in the lower classes and three hours in the higher classes to crafts. The school should provide facilities for practice in crafts even after school hours. Reading newspapers should also find a place in the school's daily programme.

The celebration of birth anniversaries, festivals, etc. upsets the daily routine of the school. Such breaks should be welcome in so far as the

activities that cause them greatly contribute to the development of the pupils. No interference with the daily routine of the school should, however, be permitted except on such occasions.

Correlated teaching should be adopted in the school, if the students are to acquire essential knowledge in the process of the proposing and carrying out of the various activities and in the evaluation of their success. *There is no place for independent teaching of the traditional subjects in the Basic school.* Nor are periods allotted subject-wise in the time-schedule of the school. Time should, however, be allotted to the different activities inside the school. All essential subject matter from the various subject-fields is acquired by the pupils during the successful working of the school plan, which is based on numerous activities. The teacher has however, to be cautious not to allow any particular subject-field to be neglected.

(t) *Assignments for Home:* Homework has an important place in the Basic school. But, the kind of home-task assigned to pupils in traditional schools has no place here. These assignments, as occasion demands may be daily, weekly, fortnightly or monthly assignments. The following types of assignments should be given as home-tasks.

(*i*) Those that encourage reading of necessary literature for the enrichment of already acquired knowledge.

(*ii*) Those that lead to the acquisition of specialised information.

(*iii*) Those specially meant for bright pupils.

(*iv*) Those meant to develop the different interests and aptitudes of the students.

(*v*) Those meant for the improvement of neglected and backward pupils.

(v) *Records:* Records kept in a prescribed form, giving both individual and collective data, show the progress made by students and school. Records are also a means of self-evaluation and extremely helpful in the gradual progress of the school. The Basic School should keep the following records.

1. *Teachers' Records:—*

(*a*) Annual Plan.
(*b*) Monthly Plan.
(*c*) Daily Lesson Notes.
(*d*) Monthly Progress.
(*e*) Collective Record of Crafts.
(*f*) Individual Crafts Diary.
(*g*) Notes from Self-Study.
(*h*) Record of Social Activities.

2. *Students, Records:*

(*a*) Diary Plan.
(*b*) Record of Daily Progress.

(*c*) Record of Crafts.
(*d*) Notes from Self-Study.
(*e*) Progress Record.

3. *School Record* :

(*a*) Enrolment Register.
(*b*) Attendance Register.
(*c*) Stock Book.
(*d*) Order Book.
(*e*) Record Relating to Different Crafts.
(*f*) Record of Evaluation of Progress.
(*g*) Sales Department Register.
(*h*) Stock Book, Catalogue and Issue Book for Library.
(*i*) Record Relating to Income and Disbursement of Pay ; etc.

Chapter IV

EDUCATION IN BASIC SCHOOLS

Present Status

One of the reasons why Basic education is still suspect in the minds of many educators and educationists is the fact that the practices and methods of evaluation are, generally speaking, both indefinite and inadequate. The critic of Basic education argues that there are, at the present moment, no adequate means of assessing the development of children attending the Basic Schools and of comparing their development, specially on the intellectual side, with the development of pupils in the non-Basic schools. It is, therefore, necessary that Basic school teachers should develop systematic techniques of evaluation and efficient instruments of educational measurement which will enable them not only to assess their own efforts but also to discover the general and special abilities of their pupils and to diagnose their difficulties and incapacities. There is an evident tendency among Basic school teachers to assume that, if they have put their pupils through certain experiences or if they have tried to teach them certain skills or to impart to them a certain measure of knowledge, all of them will have benefitted equally by their efforts.

Need for Systematic Evaluation: No teacher needs much persuasion to accept the thesis that teaching that is not followed by adequate evaluation may be partially, if not wholly, fruitless. The adage which says that 'the proof of the pudding is in the eating' applies perfectly to the teaching-learning situation. The success of the teacher's effort to teach and the pupil's effort to learn can only be gauged in terms of what the pupil can do and what he actually does. This implies that the pupil's many-sided development needs constant and careful 'observation' which is only a more general term for 'testing', 'examination', 'evaluation' and 'assessment'. Unless we know at any particular time how much knowledge a child possesses in a particular field or the extent to which he has acquired a particular skill, it is not possible for us to plan with any real value for the child the next steps in his development in that particular field of knowledge or in that particular skill. A child who cannot add cannot profitably be taught to multiply, and a child who does *not know* what is the best manure for potatoes cannot be expected to grow as good a crop in his vegetable garden as a child who does. Hence the need for an adequate system of testing of the pupils' developing knowledge and skills at regular intervals.

Scope of Evaluation: It is the avowed aim of Basic education to provide for "the preparation of a new type of individual, all of whose faculties —physical, intellectual, aesthetic and spiritual—have been harmoniously developed into an integral personality, and the creation of a new social order based on cooperative work". It is evident, therefore, that the testing of scholastic attainment cannot be the only purpose of evaluation in the Basic schools. Every aspect of the child's development has to be

adequately appraised. Such appraisal will naturally fall under two heads according to the methods of appraisal adopted—namely, the quantitative and the qualitative. There are some aspects of the child's development such as his height, his weight, his powers of physical endurance, his attainment in arithmetic or in science in so far as it can be indicated in terms of a percentage score, which can be quantitatively measured. There are other aspects of his development such as his changing attitude to manual work or his growing (or declining) sense of responsibility or his aesthetic sensibility which can be more adequately appraised in qualitiative than in quantitative terms. The Basic school teacher (no less than the teacher in a non-Basic-school) needs to employ both these methods of appraisal, if he is to have as complete a picture as possible of the development of a particular pupil at any particular point; and this he has to do if only because he is pledged to the goal of the all-round development of his pupils. He has, for example, to make a note of the degree as well as the quality of curiosity or inquisitiveness displayed by each one of his pupils; he has to observe whether or not they are developing a sense of excellence in their craft work; he has to study how they are adjusting themselves to the life of the school and how they are cooperating with their classmates in group activities and projects; he has to discover the forms and the media of self-expression which are best suited to the special talents of individual children. These are but a few instances of the kind of qualitative appraisal of their pupils that Basic school teachers are called upon to undertake, month by month and week by week—nay, even from day today specially in the case of backward children. This means that teachers need to make careful and systematic observations and to maintain adequate records in their diaries of the many-sided development of their pupils.

Necessary Organization: If the all-round development of pupils is to be aimed at, the school needs to be organised to provide for such development, as, indeed, many Basic Schools really are. It needs to be organised as a community engaged in cooperative work. This children need to have as large a share as possible in the organisation and running of the school. They can be very profitably associated with the day-to-day planning of the school programme. They can be encouraged to work in groups, the duties of which are regularly interchanged in order to enable them to have a varied experience. Only to the extent to which they are encouraged to assume responsibility for the activities of their corporate life, will they grow up to be efficient citizens of a democratic state; and only to the extent to which "doing" and "being" are emphasised in the school rather than mere "knowing", will they develop wholesome and integrated personalities. The non-Basic school with its emphasis on knowledge seeks only to test the attainment of knowledge in the various school subjects. The Basic School, without underrating factual knowledge, should seek also to assess the activities of its pupils and to evaluate the traits of personality they are developing in and through the life of the school. For example, the teacher must know not only whether his pupils themselves always use *Khadi* but also whether they plead with their guardians, their relations and their neighbours to use *Khadi*. He must know the extent to which they favour the products of cottage industries. He must know also whether they use their leisure time profitably in the pursuit of handcraft.

Kinds of Assessment: As Basic education is concerned with the

totality of the child's growth and development, it is evident that the teacher will be called upon to make a variety of assessments if he is to get a complete picture of the child. First of all, as in any other type of school, there will be an assesssment of the scholastic achievement of pupils. In this respect it is safe to generalise and say that the existing practices in the Basic schools throughout the country are neither adequate nor uniform so that there is a great scope for experimentation and research for developing appropriate methods and techniques of testing and examination. Most Basic schools require their pupils to maintain diaries and records of their work, and they undertake a periodical assessment of these records with a view to gauging the children's progress in their studies. Although this is one valuable basis of assessment, it cannot be made the sole criterion of a child's scholastic proficiency and needs to be supplemented by some form of periodical tests.. Secondly, as Basic education is craft-centred education, there is need to assess the craft work of the pupils. Obviously, different crafts will call for different bases and methods of assessment. Vegetable gardening, for example, cannot be assessed in the same way or on the same basis as cardboard work, nor can there be a common form of assesssment for weaving and for woodwork. In the third place, as the educational programme in a Basic school has to be developed round the activities of the school community in which every child is a participant, it becomes necessary to evaluate the child's participation in community work. Such community work will include the production and preparation of food, activities directed towards the maintenance of personal and community cleanliness, health and hygiene, programmes of social service and other cultural and social activities. A fourth kind of assessment that every Basic school should undertake, if it is to remain true to its avowed objective of developing the personality and character of its pupils is the assessment of personality and character. Few Basic Schools to-day are attempting to do anything in this direction; and yet it constitutes the most important aspect of education. And finally, it is necessary to make a periodical assessment of the children's health and physical development. The Basic school is vitally interested in the health and physical development of its pupils which has such a great bearing on their intellectual and emotional development; and, therefore, it cannot afford to neglect or to be indifferent to this important phase of examination and evaluation.

Let us now take each one of these five broad aspects of assessment and discuss them a little more in detail.

Assessment of Scholastic Achievement: There is a certain amount of variety in the methods of assessment of the scholastic achievements of pupils used in different Basic schools The more orthodox Basic schools hold no special tests, annual, quarterly, monthly, or weekly. They depend almost entirely on the children's daily diaries and subject notbooks and on the teachers' records of the work of their pupils. They believe that "the daily diaries of the pupils and the daily notes of lessons of the teachers, if thoughtfully and carefully written, should lead to a fair and accurate assessment of the quality of work of both." The less orthodox schools are not quite sure that such notes and diaries will always be "thoughtfully and carefully written" by the children, and so they seek to supplement these records with periodical tests and examinations. In many places, however, such tests and examinations are given so much importance and are so like the traditional

essay type of examination that they are likely to do more harm than good to the pupils. What is wanted today in Basic education is experimentation with new-type objective tests which should find a place alongside with essay type tests. Such tests, given periodically, and supplemented by the records of formal classwork maintained by the children and by the teachers, should provide an adequate basis for assessing the scholastic achievement of pupils in Basic schools.

At this stage, it would be useful to discuss a little more in detail the nature of the achievement that may be sought to be evaluated in each of the branches of scholastic study.

Achievement in the Mother Tongue : In assessing achievement in the mother tongue, whether it be through occasional tests or on the basis of the day-to-day performance of the children, there are three aspects of linguistic ability that have to be kept in mind and evaluated : (1) oral expression, (2) expression in writing and (3) comprehension (of both the spoken and the written word). Naturally, there will be little or no written work in the early stages during which the emphasis will be mainly on reading and oral expression. In reading, both speed and accuracy will need to be emphasised. There is a place also for recitation in the early stages and for elocution and debating in the higher classes. There is no reason why ability to speak in public or to debate should not be included among the linguistic abilities to be fostered—and, therefore, to be evaluated—in the higher stages of Basic education. Fluency and accuracy of speech and clarity of ideas need to be stressed most of all in all exercises in public speaking. The written tests can be organised to test both comprehension and expression. They will include tests of vocabulary and idiom and exercises in the right use of words and in syntax. These written tests need to be of both the essay type and the objective type ; for whereas some aspects of language like vocabulary can be more easily examined by means of the objective type tests, other abilities like the ability to express ideas clearly and effectively can best be examined through exercises of the essay type. With some experience in the use of all these various types of exercises and tests, it should be possible to work out tables of weightage for these different types at different stages of the Basic school. That there is much scope for experimentation in the field of testing in the Basic schools there is little doubt, and it is a healthy sign to find that there are a few schools that are conducting some useful experiments. To give an example, this is how one school in the state of Bombay has organised the oral examination of its pupils in language :—

1.	Reading a prose passage	10 marks
2.	Giving the gist of the passage read	10 marks
3.	Reciting a poem or a song (prepared for the village entertainment programme) ..	10 marks
4.	An appreciation of the poem or the underlaying idea of the song	10 marks
5.	An extempore talk on a subject like prohibition, the 'grow more food' campaign, village uplift, etc.	10 marks

Achievement in Mathematics:—In assessing achievement in mathematics, it is necessary to emphasise both speed and accuracy in the higher,

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stages of the Basic school. In the first two or three classes, however, accuracy should be regarded as more important than speed. There is need in the early classes to give the children plenty of exercise in mental arithmetic. It is necessary to maintain careful records of the children's progress in mathematics and to give due weightage to their day-to-day efforts in the final result. An assessment of achievement in mathematics that is based only on quarterly or terminal examinations can often be very misleading. It is important also to remember that problems set in mathematics should primarily test a child's understanding of mathematics concepts, principles and operations and his computational skill; they should not be primarily intended to test his ingenuity or the extent of his intelligence, which is the proper function of intelligence tests.

Achievement in Social Studies: Social studies form an important area of Basic school work in which the maintenance of notes by pupils helps in the assessment of their achievement. Pupils should be encouraged to prepare notes of the correlated lessons attended by them. In the higher grades, their notes should also include summaries of the library reading done by them on the topics discussed in class. These notes should be regularly checked by the teachers. But however good the notes maintained by the pupils may be, it is necessary to test the pupils in Social studies from time to time to ascertain whether they have assimilated the knowledge imparted to them and to gauge their understanding of social life and of social laws. This indicates the need of both objective and essay type tests. However, tests in Social studies need not always or even mainly be written tests. There is great scope in this area for the use of oral tests as well. Inasmuch, however, as the Basic school stresses actual being and doing and not only knowing, the social and civic competence of pupils can hardly be adequately judged by the notes they keep or the results of their tests. It is necessary to maintain proper records of their social behaviour in and out of school and their attitudes to their social environment. This aspect of school records will be discussed at greater length when we take up the question of the assessment of personality development.

Achievement in General Science: Like achievement in Social studies, achievement in general science too can best be assessed on the basis of both tests and pupils' notes. Such notes will contain not only summaries of lessons done in the class but also the assignments periodically undertaken by the pupils. In the lower classes, such assignments will take the form very largely of observations made by the children of the world of nature around them. In the higher classes, there will be reports of experiments conducted by the children in the school and at home. As in social studies, so also in general science there is scope for the use of oral tests both for testing knowledge and for testing understanding of scientific laws and principles.

Achievement in Art and Music: Basic education cannot and should not be regarded as complete, unless provision is made in its curriculum for art and music. At present, both art and music suffer from comparative neglect at the hands of Basic teachers. Very few Basic institutions try to make any assessment of achievements in art and music. The following items for assessment in this part of the curriculum may be suggested:

1. Acquaintance with good examples of the pictorial and plastic arts.

2. Acquaintance with the traditional and decorative arts.
3. Capacity for self-expression through drawing, painting, clay modelling, etc.
4. Knowledge of good music, classical and traditional.
5. Ability to sing devotional and national songs in chorus.
6. Power of discrimination between good and bad art.
7. Ability in organising festivals and other cultural activities.

The principal basis for the assessment of achievement in art and music will naturally be the child's day-to-day performance and participation as recorded by the teacher in his diary. Occasionally the teacher may set a special test in art or singing to encourage the children to make a special effort to demonstrate their talents. What is most essential, however, is to see that every child is given opportunities from the very first class to express himself through the media of art and music so that any special talent in these two fields is discovered at an early age and is given special encouragement.

Achievement in Craftwork : As craftwork forms the core of Basic education, assessment of achievement in craftwork has received the largest degree of attention. Most Basic schools maintain more or less complete records of the craftwork of their pupils. These records are maintained both by the children and by the teachers. In addition to daily records, there are also monthly records. There are a few points about these records, however, that need to be stressed here. In the first place, both the quality as well as the quantity of the work done by the pupils need to be recorded by the teacher. This is necessary because there is a general tendency both among teachers and pupils to emphasise quantity regardless of quality. Incidentally, it may also be said that in judging the amount of work turned out by a pupil, the time taken has also to be considered, because this gives an indication of the speed of work of the pupil, and speed is an important element in a craft. Secondly, it is necessary to assess the pupil's ability in the various processes involved in the craft. For example, in the case of spinning, the prior processes of cotton cleaning, giving carding and sliver making are all important and must be considered. Similarly, in the case of wood work the pupil must be rated, among other things, on his ability to saw, to plane and to chisel, as these are essential processes in the craft. This implies that the teacher's records of each pupil's craftwork need to be fairly elaborate. Thirdly, there are concomitant abilities that pupils are expected to develop in the course of their craftwork and the teacher should keep an eye on this aspect. In connection with weaving, for example, the following qualities come to mind : first, the ability to judge the quality of the implements, to take proper care of them and to repair and mend them ; second, the ability to judge the quality of the yarn—its count, evenness and strength ; third, the ability to cut down wastage of materials to the minimum. Similarly, it is necessary for the teacher to look out for and to record the attitudes and habits of work developed by the children. Take, for example, the sense of orderliness, the habit of systematic and thorough work and the feeling of joy in a piece of work well accomplished. Yet another important point about records of craftwork is that one of these records should be an account of income and expenditure. Basic education requires that the products of the children's work should be saleable and children can

be made to realise this fact better if they maintain an income and expenditure statement. It is also a useful practice to convert the data given in the various records kept by the pupils and the teachers into charts and graphs which can show at a glance the various aspects of the craftwork done in a school.

It is to be expected that if detailed records as indicated above are actually maintained, the final assessment of achievement in craftwork will be based mainly on these records. However, it is also possible to test the children in the different processes of the craftwork once a term or twice or thrice a year as is done in some Basic schools. The following table will serve as an illustration of how such a test can be organised :—

Table 1: Organisation of a Test in Spinning and Weaving

Item	Marks	Method	System of Marking
1. Carding and Slivering.	8	Children are supplied with a sufficient quantity of lint and are asked to card and prepare slivers within 15 minutes.	For first tola no mark. For each tola after that 2 marks.
2. Spinning on Charkha.	12	Children are asked to spin on the charkha with their own slivers for 15 minutes.	For the first 30 *tars* no mark. Then for every 5 *tars* 1 mark.
3. Warping, filling up bobbins and joining.	15	Children are asked to carry out each of the activities for 5 minutes.	For first 5 *tars* no mark. Then for 3 *tars* 1 mark. Ease, speed and method of filling up bobbin and joining are tested.
4. Weaving of cloth with a width of 27″ .	25	Children are asked to weave for 15 minutes.	For first 4 inches no mark. Then for each inch 2 marks.

Another example of a test, this time in agriculture, will also be of interest. The children may be tested twice a year in the following items :

1. Recognition of samples of seeds, manures, plant diseases and insecticides (about 15 samples are kept) .. .. .. 15 marks
2. Yoking the bullocks and ploughing or *backaring* the land 8 marks
3. Yoking the bullocks and driving the moat .. .. 7 marks

4. Preparing plots for seedlings or other crops .. .. 15 marks
5. Propagation of plants by cutting, layering or budding 10 marks
6. Recognition of different poultry birds and farm cattle 5 marks

Besides regular tests of the type indicated above, it is a useful practice to arrange for an annual exhibition of craftwork. Such an exhibition can help much in judging the progress of the school as a whole and of the different classes in addition to stimulating individual children to make a special effort to produce the best work they are capable of. In such an exhibition the teachers too will display their own craft-work to serve as a model to the children. If the exhibits are released to the needs of the neighbouring villages, the exhibition may as well serve to help the pupils and the teachers to realise what they can do to improve the lives of the villagers.

Assessment of Community work and Social life

Basic education places a very great emphasis on cooperative, community work specially in residential institutions, where different groups have to be assigned to different duties, such as sweeping the floor, cleaning the the grounds, dusting the furniture, preparing the vegetables, cooking, washing the utensils, etc. In addition to such activities on the school campus, there is the programme of village cleanliness and village uplift in which the senior students generally participate. The teachers themselves participate in these various community activities and make careful observations of the work of individual pupils. In assessing such work, the main emphasis is naturally on the effort of the individual pupil rather than on the achievement of the group. It is a commendable practice to associate the students in this assessment by asking their opinions about the value of the participation of their colleagues in community activities.

In some Basic schools, in addition to the usual day-to-day community work, special programmes are periodically arranged for examining the capacity of the children to participate in community life. The following activities may be listed as samples of possible subjects for such an examination: 1. Decoration of the school. 2. Cleaning of the school compound. 3. Cleaning of a village well. 4. Preparation and arrangement of meals. 5. Putting in order the school library. 6. Organising a *Prabhat feri* and hoisting of the national flag. 7. Cleaning some black spot in a neighbouring village. 8. Organising a picnic party. 9. Organising a sports day. 10. Organising a village entertainment programme based on special topics such as prohibition, growing more food, *gram safai*, unity, health and hygiene, and Social education.

However, it is important to let the children realise that such special tests will be given a much lower weightage than the usual day-to-day participation in the community life of the school ; else, community work will become another examination subject.

Assessment of Children's Records :—As the maintenance of records of work by the children themselves is a significant feature of Basic education, some Basic schools have adopted the practice of assessing the records themselves in addition to assessing the work of the children in different fields on the basis of these records. The practice has much to recommend itself inasmuch as it is expected that the children should pay due attention to

their records. In assessing these records, the following points may be kept in view :—

1. The completeness of the records.
2. Their accuracy.
3. The regularity with which they are compiled.
4. The orderliness in which the various items are set out.
5. Neatness of execution.

Personality and Character Assessment.—In Basic education, great stress is laid on the developing of a balanced, wholesome personality and a good, strong character. All the efforts of the teachers and all the activities of the school are directed towards this goal of helping the children to develop personalities that are well-adjusted to their environment and that are conducive to the well-being of the growing children themselves as well as of society. However, there are only a few Basic schools that keep any systematic records of the traits of personality and character that children develop as a result of their education ; and yet this should be a very important aspect of the records maintained in Basic schools. It is suggested that the following traits should be assessed by the teachers :—

1. Regularity in preparing daily lessons.
2. Honesty in examinations.
3. Obedience to teachers.
4. Loyalty to the school.
5. Fairness in games and sports.
6. Truthfulness.
7. Honesty in money matters.
8. Respect for girls
9. Purity in mind, thought and speech.
10. Cleanliness in body, clothes and room.
11. Service to the sick.
12. Kindness and helpfulness to others, specially to the poor and the socially backward classes.
13. Leadership..
14. Courage to defend the right.
15. Interest in hobbies.

The children may be marked on a five-point scale, with the highest degree of a trait obtaining five points and the lowest, one. The verbal equivalents of the five points are excellent, good, fair, ordinary and poor. In this connection, it will be useful to keep in mind that it may not be possible in the case of every child to be definite about his standing on every trait that has been listed, for the simple reason that there may not be enough evidence in a particular case in respect of some of the traits. The best thing the teacher can do in such circumstances is to make no assessment of those traits in respect of which he has no adequate data.

Perhaps a better way of assessing traits of personality and character than on a five-point numerical or verbal scale as indicated above, is to

record factual and impressional statements against each trait. A few illustrations with reference to some of the traits listed above will serve to clarify this point :—

3. Obedience to teachers : .. Is generally obedient ; only once during this term was he disobedient on the playground.

11. Service to the sick .. There has been no occasion for him during this term to render service to any sick person.

12. Kindness and helpfulness to others .. .. .. Has shown kindness and has been helpful on several occasions during this term. I would rate him 'excellent' on this trait.

The list of 15 traits enumerated above need not be taken as the best or the most comprehensive list possible. It has been reproduced here as an example of a useful and suggestive list. Different schools can and will naturally have their own lists of traits and their own ways of recording the development of character and personality of their pupils.

A very important point in connection with personality assessment is that efforts should be made to see that such assessment is not purely or even largely subjective. It must be based on careful and detailed anecdotal records maintained by the teacher. A great deal of a child's personality can also be read in his own diaries as well as in the diaries maintained by the members of the children's "cabinet" and the notes kept by pupils, teachers and heads of special celebrations, festivals, cultural programmes, excursions and exhibitions. *All* this material should be used by the teacher for studying the personalities of his pupils.

In addition to reliance on the above-mentioned materials, it is suggested that objective tests be devised which would enable the teacher to assess the pupils' qualities of resourcefulness, curiosity, self-reliance, self-discipline, etc. Such tests, however, would have to be prepared by central agencies like the state bureau of educational and psychological research and made available for use by teachers who should have been previously trained in the administration of such tests. But until properly qualified and trained teachers are available for such testing, it cannot and should not be attempted.

Cumulative Records.—We have discussed the need of having a comprehensive and broad-based programme of testing and assessment in Basic schools. We have seen the need of basing the assessment of children's many-sided development on the notes and records maintained by the teachers as well as by the children themselves, on periodical oral and written tests, on the quality and the amount of the craft work done by them, and on the nature and the extent of their participation in the life of the school, the home and the village. We have stressed the need of a constant and careful observation of the habits of work, the attitudes, the traits of personality, and the moral and social qualities displayed by the children in their daily tasks and occupations. This indicates the need to maintain a cumulative record of every child's achievements and development in the various areas in which an assessment is sought to be made.

Such a record will prove useful not only to decide whether he should or should not be promoted to the next school grade but also towards a better understanding of the child by his later teachers. Guidance is an important function of the Basic school, and no programme of guidance—personal, educational or vocational—can be expected to be fruitful, if it is not based on as complete a knowledge of the child as possible. Hence the value of cumulative records.

Besides the necessary personal history of the child against his family and community background up to the point of his joining the school, the cumulative record should contain the following data :—

1. **Record of physical development**, detailing

   (*a*) the child's physical growth ;

   (*b*) his health record ;

   (*c*) his participation in games and sports ;

   (*d*) his health habits (including cleanliness) ; and

2. **Record of scholastic work,** showing

   (*a*) his application to and his progress in curricular studies, including punctuality and regularity of attendance and study habits ;

   (*b*) his participation in co-curricular activities such as festivals, cultural programmes, excursions, and exhibitions ;

   (*c*) his contribution to the social life of the school and the village community.

3. **Record of achievement in craftwork**, indicating

   (*a*) the amount of work done ;

   (*b*) the quality of the work and the efficiency and speed attained in the different processes of the craft ;

   (*c*) the concomitant abilities, attitudes and work habits developed in the course of the craftwork ;

   (*d*) the earning capacity achieved by the child.

4. **Record of personality development,** indicating

   (*a*) the development of intellectual abilities like intellectual curiosity, the power of observation, the powers of memory and imagination and the powers of reasoning and judgment ;

   (*b*) the degree of emotional adjustment achieved ;

   (*c*) the extent of the acquisition of social qualities like helpfulness and cooperativeness, patience and tolerance, sympathy, courtesy and kindness, altruism, the spirit of service and loyalty ;

   (*d*) the development of moral traits like honesty, the sense of justice, purity and moral courage ;

(e) the development of personal qualities like resourcefulness, initiative, self-reliance, leadership, a sense of responsibility, devotion to duty, perseverance, cheerfulness and happiness ;

(f) the quality of aesthetic sensitivity and responsiveness.

5. Record of the pupil's special interests and aptitudes. Basis of promotions

The basis of promotion of pupils from one grade to another must be as broad and as elastic as possible. The maximum possible freedom and responsibility must be allowed to the teachers to promote children from grade to grade. And if teachers adopt the kind of system of assessment of their pupils' development and the system of cumulative records that have been outlined in this chapter, there is very little chance of their making any serious mistakes in the promotion of their pupils to the next higher grade.

It is unfortunate that we have not yet adopted as a general practice a really sound basis of promotion of pupils from one grade to another. In many Basic schools, promotions are still based very rigidly on examination and test marks. Examine, for instance, this directive from a state department of education as regards promotion :—"A pupil should necessarily obtain 40% and 35% of marks respectively in the major subjects, namely, language and mathematics. He should necessarily obtain 35% of marks in the other subjects, namely, history and geography, civics, general science, and craft." This practice of deciding promotions in Basic schools "on the strength of the results of examinations" is almost universal.

Obviously, this basis of promotion is not at all different from that obtaining in non-Basic schools. It places an undue premium on academic tests and examinations and pays little or no attention to other important aspects of the child's life and development at school. On the other hand, in some parts of the country another practice is followed in the Basic schools which may be regarded as inadequate because it makes assessment of school work highly subjective inasmuch as it rules out all formal tests and examination. There, in a Basic school all the pupils are expected to maintain individually daily and monthly records of all the activities that they practise and the efficiency of their work is judged on the basis of the records maintained both by the students and the teachers concerned.

What we need to have in our schools is a combination of the two extreme practices described above. Assessments and promotions cannot be based *entirely either* on periodical examinations *or* on the diaries of daily work maintained by the children and assessed by the teacher. Both of these, taken exclusively, can often be quite misleading. The best basis of promotion is an assessment of the child's all-round development which is based on a regular system of records of the child's day-to-day progress supplemented by periodical tests and examination. The opinions of the child's teachers must be given proper consideration in such assessment. Every child should strive in such periodical tests and examinations to excel, not other children but his own previous achievement ; which means that in the teacher's assessment, consideration should be given to the child's

effort as much as to his actual achievement. When the time comes for deciding whether a child should be promoted to the next grade, an important point to consider would be whether, in any sphere in which a child happens to be somewhat backward, he would or would not be able with a little extra effort in the next higher grade to reach the required standard, in a reasonable length of time. If he shows a capacity for such achievement, he should be readily promoted. What is even more important is that such periodical tests and examinations should be used throughout the school year primarily for discovering the weaknesses of the children, so that they can be given more time and more attention in the studies in which they are backward and thus helped to come up to the required standard. There is little evidence today in our Basic schools of such arrangements for backward pupils. Our teachers appear to be satisfied with giving 'correlated lessons' and with getting the children to record summaries of these lessons in their notebooks. Little is sought to be known of how much of what there is in the children's notebooks has been sufficiently assimilated by them.

The foregoing discussion should not convey the impression that satisfactory attainment in the examinable courses of study should be the sole criterion of promotion. A child's special aptitudes and interests as well as his participation in extra-curricular activities and his contribution to the social life of the school community should also be considered. This cannot be taken to mean, however, that a child who is really weak in his academic studies can or should be promoted because he has a good record in other activities.

However, it is important to discourage the practice of detaining pupils in the same grade for more than a year. For statistical data from all over the country indicates that there is considerable leakage and wastage in the elementary stage of education, and one of the causes of such wastage is the practice of detention. In the case of some children at least who are found at the time of promotion to be backward, it may be possible to do one of two things: either they may be promoted or given special attention in the next higher class or they may be kept for a few months of the next session in the same class and given special attention and then promoted to the next class if they have come up fairly to the required standard. The former practice has more to recommend itself inasmuch as it avoids the discouragement that results from detention both for children and for parents. The best solution of this problem seems to be to have two or three categories or streams of children in each grade according as they are above average, average, or below average, with free scope for interchangeability from one stream to another, based on the progress of each child. The teacher should endeavour to adapt the curriculum as well as his methods of teaching to the level of ability of each category in his grade. Such a practice would really cut down detentions to the barest minimum that is absolutely unavoidable.

Training in Educational Testing and Measurement :—It is obvious from all that has been said in this chapter that training in educational testing and measurement should be an important function of all training courses for Basic teachers. If, for example, we expect them to keep cumulative records they must receive adequate training in keeping such records. The suggestions that have been made in this chapter serve only as broad indicators of the kind of records that would be helpful. Details of how

such record forms should be prepared and how the records should be maintained are to be provided in the training schools and colleges either in the regular courses or in special courses. It is not possible in this brief chapter to go into such details. Similarly, with regard to the question of test construction, teachers would require to be given special training in this kind of work even though some excellent texts in English are now available that deal very adequately with this phase of the teacher's task. A good, useful book on which to get started is Dr. Amil W. Menzel's "Suggestions for the Use of New Type Tests in India," a third edition of which was published in 1952 by the Oxford University Press. It has been suggested earlier in this chapter that standardised achievement tests need to be worked out in the different subjects of the Basic school curriculum and that state bureaus of educational and psychological research could well take up this work. This would be a great help to teachers, no doubt; but it would not at all free the institutions of teacher preparation from their responsibility of training teachers in the administration of such tests. Teachers would also need some training in the preparation of objective tests, because the Basic school curriculum is not a rigid curriculum for every school; rather it is a curriculum growing out of the experiences of children and of teachers in a particular physical and social environment, so that a test that may be valid for one set of children in one area may not be valid for another set of children in another area, and, therefore, teachers should be able with some experimentation, to frame valid and reliable tests for their own use.

Chapter I (a)

RELATION BETWEEN SPINNING AND WEAVING

The processes of spinning and weaving are closely related to each other. Both are needed in the manufacture of cloth. Therefore in a Basic school, there should be facilities for the teaching and practice of both. In the upper grades, the boys should take up spinning and weaving together while the boys in the lower grades shall only spin and their yarn, should be woven into cloth by the boys of the upper grades. Thus spinning and weaving will merge into a single cooperative activity.

Preparation of Definite Plan.—A definite plan of cloth manufacture should be laid down at the beginning of the session. Every boy should have his own plan. The class teacher should make a plan, keeping the needs of the whole class in view. Thus the teacher's plan represents the collective form of the plans prepared by the boys. The boys prepare the plan under the teacher's guidance. The plan should take into account factors such as tools and machines, available raw materials, the capacity of the boys, etc. It should mention specifically the work that the boys are expected to do alone as also the work in which they require assistance.

While executing the plan, the students may be confronted with problems concerning the use of a new tool or the learning of a new process. The teacher should then, give a demonstration of what is required to the students and stimulate them to do likewise. In the professional class, the teacher should never waste even a single moment. He should be vigilant while the boys are busy with their work so that he may help them personally as occasion demands.

For the thorough execution of craft work, it is necessary that the tools should be faultless. The tools should, therefore, be examined before they are used. The boys should be so trained that they do not begin the work unless the instruments are in full working order.

Progress Report

The boys should prepare their own progress report, when they have completed their plan. In the report they should include the following:—

1. The processes involved in the work.
2. The methods adopted for the execution of the processes.
3. The instruments used.
4. The raw material required, how and whence got ?
5. The total time given.
6. The difficulties solved and how ?
7. The processes that required the cooperation and assistance of others and to what extent ?

8. The knowledge acquired through the work, experiments performed and observations made.

9. Was the work done according to the Plan ? In case complete success was not achieved reasons for it ?

Time devoted to Craft work

The practice of spinning and weaving should not be limited to the school hours alone. It should be so planned that boys continue the practice even in their homes. Their efficiency will increase and spinning and weaving will find a place in their homes also. In this way, this craft will bring the school and the home in close contact with each other.

Manufacture of tools.—In the craft department of the school, there should be arrangements for the manufacture of tools. Only those tools which cannot be manufactured in the school and are useful, should be bought. A cooperative society consisting of all the teachers and students of the school may be organised for this purpose and all the required material should be bought from this society. As far as possible, the students should be enabled to buy the necessary tools with their own earnings from the craftwork.

Labour and its use.—In every school there should be a provision for students to open accounts in their names with the local post office. Whatever a boy earns by himself working in the school hours should be divided into two equal parts, one part being deposited in the school sufficiency fund and the other going to the student's account. If a boy can afford to earn something by virtue of his labour outside the school, he should have every right to retain his earnings and to credit them entirely to his account. Thus his labour will be well rewarded and he will consequently develop faith in labour.

Cooperation of village artisans.—If there are experienced artisans in the villages near about, their help should be sought at times. Students should go to their places and see their work and if they find any special features which would prove useful, they should incorporate them in their work.

School-Community Relationship.—A collective effort should be made by the school community to expand and to popularise spinning and weaving in the neighbourhood. This will prove an effective means of bringing about contact with the people'. The village economy will thus improve and the school will obtain the full cooperation of the village folk. Then the school shall be rightly called the laboratory of the village. With the help and the cooperation of the villagers, the school will improve and the imporved school will be a means to village development.

Arrangement of Cooperative Stores.—The school should have its own central store so that the required quantity of raw material and other necessary things may easily be obtained from there. It will be run by the students of top classes in groups by turns. The statement of income and expenditure with the manufactured goods of each group should reach the store by the end of each month. On the basis of this the collective statement of income and expenditure of the school should be prepared.

Scrutiny of Accounts.—The teacher should scrutinise the individual and collective records of each group every month and send them to the head of the institution for inspection and necessary suggestions. The teacher should also make suitable remarks and suggestions about the monthly progress of the work in the account book of each student. This will facilitate the assessment of yearly, half-yearly, and quarterly progress. Such evaluations will help the students to make up their deficiency and to improve their work.

The planning of exhibitions should be a special feature of the school curriculum. In such an exhibition, maps, charts, reports and statements of the students, progress in work should be shown. The statement of the experiments conducted by the students will prove useful. Specimens of manufactured goods should also be displayed at the exhibition. Variety should be the main consideration in the selection of articles for the exhibition. Besides, the written reports and manufactured goods, the demonstrations of various processes involved in their production should also be arranged. An exhibition of this kind will give the students an opportunity to show their organising capacity and artistic taste.

A few suggestions are given below for the guidance of teachers of various grades :—

Grade First.—The teachers of this grade should talk to the children in their mother tongue familiarly and acquaint them with the activities going on in the school so that they begin to feel interested in them. This programme should last for about a week. Thereafter, the studnets should be given *taklis* to play with. But, it should be borne in mind that from the very beginning they should be so trained that they handle the '*takli*' correctly, spin it on some wooden piece, learn to keep it carefully, know its parts and sing in chorus while spinning. After they have learnt how to handle and spin the *takli*, the children should be given small cotton rolls.

From the outset, care should be taken that not a single inch of yarn is wasted, or the evenness and strength of the yarn sacrificed during the acceleration of the speed. Whatever quantity is spun should be usable; this should be emphasised from the outset. The teacher should give a demonstration and show how to wind the yarn around the winder and count the rounds while winding. In the initial stage, spinning may be allowed to continue from ten to fifteen minutes ; later on, when the children have acquired some ability, the duration may be increased from 20 to 25 minutes at a stretch. In order to facilitate the work, the children should be asked to change their position. In this grade, sole posture, shank posture, and cross-legged posture may be tried in turn for spinning.

Teachers should then place some proposals before the children (*about the uses to which manufactured cloth may be put i.e. the shorts and shirt*). The manufacture will require about 12 *gundis* of yarn. The students of this grade will not be able to card cotton and weave ; so the students of the higher grades will card the cotton for them and weave the cloth out of the yarn spun by them.

Besides spinning, the students of this grade shall have practice in the following :

1. Cleaning cotton

2. Preparing *phirkis*
3. Picking out cotton
4. Preparing *lattis* and *gundis*
5. Preparing slivers out of the carded cotton.
6. Preparing a bamboo *takli*

The observation of cotton plants in the garden should be treated as part of nature study. Every process of spinning should be presented to the students in the form of a problem and the knowledge imparted to them should show the relation between cause and effect.

Simple experiments on spinning should be carried on in this grade and the boys should be given opportunities to draw conclusions from their work and observation. It is their own conclusions that will lend solidarity and stability to their knowledge. The following experiments may be made.

1. Hard *kukri* and soft *kukri*.
2. Hard sliver and soft sliver.
3. Long sliver and short sliver
4. Bundled sliver and exposed sliver.
5. Even yarn and thin yarn.
6. Spinning in cross-legged and shank postures.
7. *Takli* with a long peg and *Takli* with a short peg.
8. Smooth *Takli* and rough *takli* etc.

In learning and practising the various processes of spinning, students should acquire practical knowledge of the following:

1. Names and functions of the various parts of *Takli*.
2. Correct postion of *Takli*.
3. The need of spinning *Takli* on a wooden piece.
4. The need of preparing conical *Kukri* and hard *Kukri*.
5. Even and strong yarn.
6. Marks of a good sliver.
7. Various parts of the cotton plant.
8. Requirements for the growth of plants.
9. Marks of ripe, rotten, yellow and green, cotton seeds.
10. The need of making *phirkis*.
11. Various postures and rate of spinning.
12. Correct use of material and tools.
13. Simple oral expression of ideas about the various processes of spinning.
14. Practice of reading and writing small words and sentences about the spinning processes.
15. Practice of work-songs.
16. Practice in hearing and telling short stories about spinning processes and tools.

17. Ordinary familiarity with all the processes of cloth manufacturing.
18. Counting the *phirkis*, slivers and rounds of yarn.
19. Reading and writing numbers and small figures.
20. Knowledge of weights and their use for weighing seed cotton, cotton and yarn.
21. Knowledge of the prices of yarn and spinning tools, and of ratios between rupees, annas, and pies.
22. Knowledge of ordinary measurements for measuring *takli*, winder and sliver.
23. To know the speed of spinning and to know how to read the watch to distinguish between its long and short hands and to be able to read the time.
24. Knowledge of the shapes of tools and articles of spinning.
25. Ability to do simple addition and subtraction while issuing *takli* wooden pieces, sliver etc.
26. Knowledge of plus and minus signs.
27. Observation of the effect of weather on the spinning tools and materials rusting of wicker, wetting of cotton, drying of cotton, hardening of the fibres, breaking of yarn, keeping of slivers in bundles, breaking-up of cotton buds, drying of leaves etc.
28. Practice in making drawings of simple forms on the basis of observations and practical work.

Second Grade.—The processes that boys should learn in the first grade should also be practised in the first grade . Spinning with the *takli* should continue. The boys who are comparatively older and more skilful should be given the *kisore chakra* for spinning., Keeping the ability, physical development and taste of students in view, carding can also be introduced. Child carding bow will suit the boys of this grade. The students of this grade should have more say in the selection of their process than those of the first grade. Every student should have to spin about 18 *gundis* of yarn for a pair of shorts, a short shirt and a towel for himself. The boys of this group should also maintain a record of their spinning. There should be definite entries of date, time and the quantity of the work done in the record. At the end of each month, a monthly statement should be prepared. The students should have the teacher's help in this regard.

The children in this grade should learn the following :—

1. Decoration of the child carding bow ; names of the parts of the carding bow and their use, practice of fitting the carding bow.
2. Fitting of the *Kishore Chakra*, names of various parts and their functions.
3. Distinguishing marks of a carding bow and good carding.
4. Characteristics of a good *charka*.
5. The defects of a *charkha* and how to remove them.
6. Ways of accelerating the spinning speed.
7. Statement of daily spinning and ts preparation.
8. Oral description of the craft-processes.

9. Construction of sentences on the basis of newly learnt words.
10. Recitation of small poems and reading of prepared lessons.
11. Report of the work done in short sentences.
12. Descriptions of tools used.
13. Talks and compositions, based on the utility of spinning.
14. Addition and subtraction to find out the progress in spinning estimating the cost of yarn and cotton. Weighing raw and manufactured materials. How to record the time from a clock or time-piece. The value of digits, measurements of various parts of the *charkha* and the carding bow.
15. Cooperation in the organisation and direction of the craft work. Cultivation of habits of punctuality, responsibility and correct use of articles.
16. Observation of cottage industries in the village.
17. Effect of seasons on spinning and weaving processes and tools and machines.
18. Reasons for wetting gut, emission of unusual sound from the gut, breaking of gut, breaking of thread, use of ashes in spinning, breaking up of cotton in carding, etc.

Third Grade.—In this grade, the practice of spinning with the *takli* and *kisore chakra* and carding with the child carding bow should be continued as in the second grade. The boys should take to collective spinning for personal and school purposes. Collective spinning may also be planned to provide yarn for making dusters and table cloths. Every student may take up a project of spinning yarn sufficient for two pairs of shorts, two short shirts, a towel, a handkerchief and a cap. Spinning projects may vary according to the needs and skills of individual students. Normally, a boy should be able to spin at least 50 *gundis* of yarn and the average count of yarn should be 12. Spinning speed should be about 40 '*tars*' in half an hour on a takli and one '*latti*' per hour on the *charkha*.

In this grade, the boys should have the following knowledge in relation to spinning. :

1. Knowledge of fitting *charkha* and carding bow.
2. Suitable conditions for the preparation of slivers.
3. Kinds of carded cotton and their effect on the spinning speed.
4. Relation between the wheel and the speed of the '*takua*' in a *charkha*.
5. Gut *amal* yarn *amal* and cotton *amal* and the effect of these on the spindle.
6. Reasons for the defective working of the *charkha*, the gurgling and slipping of the spindle and resistance in the charkha.
7. A definite estimate of the spinning angle and the strength of the yarn.
8. Calculation of this count of the yarn, by weighing the yarn and its estimate with the eye.
9. Finding out the evenness of the yarn on a black cloth.

10. Finding out the strength of the yarn with the help of the sound produced by breaking the yarn.
11. Preparing a statement of spinning processes.
12. Writing an application for the supply of the material.
13. Preparing the diary and the report.
14. Study of lessons on spinning and weaving, study of small books, loud reading and silent reading.
15. Collecting poems on this subject and their recitation.
16. Listing terms connected with the tools and machines and the processes of the work.
17. Beginning of applied Grammar for syntax, filling up empty spaces; selection of synonyms and antonyms; correction of grammatical errors in the diary, written and oral statements.
18. Reading newspapers and childrens' magazines, talks and dialogues.
19. Practice of division sums to find out average count of the yarn, and average speed. Practice of compound rules and operations involving seers, *chhataks*, *tolas*, rupees, annas and pies for keeping a record of the cotton received and the weight of the yarn spun and its cost. Simple fraction, half, quarter, and three fourths in connecton with weighing cotton and yarn. Preparation of a collective statement of spinning at the end of every month.

Maintenance of a record of the spinning and time allowed for the fulfilment of the project.

20. Special study of the effect of seasons on tools and machines and processes of the work.
21. Knowledge of materials used in spinning and their geography.
22. Elementary knowledge of institutions aiding the development of spinning and weaving.
23. Khadi manufacturing centres of the district and their location on the map, roads and routes leading from the school to these centres. Practice in drawing the district map.
24. Location of Basic institutions on the map of the district.
25. Industries of the neighbouring area and their relation of spinning.
26. Short stories about the origin and development of spinning and carding...Stories of the people contributing to the development of handloom industry, especially khadi.

Fourth Grade.—The students shall in this grade, start cotton growing. Cotton growing will be taken up as a project. For experiment, two or three kinds of cotton may be sown and a complete record maintained. Cotton ginning with the help of *satai patri* and *otani* should be practised. The boys should do cotton cleaning, cotton picking and carding and slivering in groups. A comparative study of speeds of spinning in various postures should be made. Carding should be done with the help of a carding bow of middle size. "*Kishore chakra*" is a suitable spinning wheel for the students of this grade. Spinning may be practised on the local *charkhas* also. The students will select projects under the guidance of the

teacher, according to their needs, tastes and facilities. For the manufacture of the cloth for the class and the school, there should be arrangements for collective spinning. A plan for making shorts, half shirts, the *kurta*, underwear, towels, sheets table cloths and so on may be taken up by the students individually. Every boy should spin at least 72 *gundis* of yarn. The count of the yarn should be at least 14. Carding rate, including the preparation of slivers, should be four tolas per hour. Students should have an average speed of spinning 60 *tars* in half an hour on the *takli* and about 240 *tars* on the *charkha* in an hour.

The knowledge required in this connection is as follows :

1. How to grow cotton and the conditions for cotton cultivation.
2. Cotton pests and their prevention.
3. To effect climatic changes on cotton cultivation.
4. Properties of good cotton and characteristics of cotton fibres.
5. Interrelation between kinds of cotton and counts of yarn.
6. Methods of testing yarn strength.
7. Parts of bow and test of a good bow.
8. Intricacies of spinning and weaving.
9. Complete knowledge of fitting the kisan *chakra*.
10. Boiling resin and properties of good resin.
11. Ways of improving the speed of the *charkha*.
12. Calculation of the counts of the yarn.
13. The function of the spring in a *charkha*.
14. Construction of "Morhia" and a knowledge of slanting.
15. Why the "*takua*" 'jumps' slipping of *amal* and resistance in the *charkha* and how to remove defects.
16. Maintenance of progress reports. Submission of written and oral statements of one's work, correspondence on the purchase and sale of goods.
17. Study of selected books on spinning and weaving and cotton cultivation. Writing original stories and essays based on the practical work and acquired knowledge and their publication in the school magazine. Knowledge of simple grammatical rules. Presenting phases of the history of Indian textiles industry in the form of a drama on special occasions. Recitation of poems on the different processes of the work. Participation in verse competition. Collection and recitation of poems at special seasons and other natural phenomena.
17. Keeping account of income, expenditure and receipts. Solving problems of addition, subtraction, practice and unitary method. Preparing a collective statement of account for the class. Working out the average of the work done. Understanding the relation between the base wheel and the speed wheel in fitting the *charkha*. Finding out the centre of a circle. Recognising various kinds of angles in connection with the determination of the spinning angle.

18. An elementary knowledge of the development of the *khadi* movement. Life sketches of great men contributing to the development of *khadi*. Cotton growing areas and their geographical positions on the map of India. Manufacturing and selling centres of *khadi*. Means of Communication. History of development of spinning tools. Kinds of cotton in use, how and where to get them. Practice of drawing maps and of locating the cotton growing areas, *khadi* production centres and means of communication.

Fifth Grade:—Practice in the processes learnt in the last four grades should continue in this group also. The boys should be given the "*Yavarda chakra*" and bamboo *charkha* to spin with and ginning, carding and spinning of fine quality should also be practised with long-fibred cotton. The carding-bow of "munj" is best suited for carding purposes. Fine spinning may also be practised on the bamboo *takli*. The boys should be able to keep accounts of the spun yarn, the consumed cotton and the woven cloth. Every boy should spin 90 *gundis* of yarn. The count of ordinary and fine yarn spun by him should be 16 and 40 respectively. It is expected of the children in this grade that they should acquire knowledge in the following :

1. Assembling various kinds of *charkha* and carding bows.
2. Keeping accounts of cloth sufficiency.
3. Estimating the amount and cost of cotton and yarn to attain cloth sufficiency for the school and the village.
4. Comparative study of various kinds of *charkhas* with respect to their speed, production and other characteristics.
5. Testing the uniformity of yarn.
6. Determining the resultant speed.
7. Determining the frequency of the spindle.
8. Oiling the wheels of the "*yavarda chakra*" and the "*Khanch*" of *morhiya*.
9. Advantages of slippery *morhiya*.
10. Causes of slipping and their removal.
11. The shape of the pulley (ghirri) and its effect on the speed of the spindle.
12. Tests of yarn and its characteristics.
13. Study of books relating to various processes and tools and machines. Consulting the dictionary in the case of difficult words. Preparing a report of the plan and its progress.
14. Names of various kinds of *charkhas* and their history.
15. Indian history as deduced from the history of the Indian textile industry.
16. Cotton growing areas in the country and their location on the map ; kinds of cotton and their produce.
17. Cotton growing areas of the world and India's place amongst them.
18. History of the establishment of textile factories in the country.
19. The cloth problem of our villages and its solution.

20. Moisture and its absorption.
21. *Charkha* wood and its characteristics.
22. Causes retarding the speed of the spindle.
23. Friction in *charkha*.
24. Flexibility in "ama".
25. Practice of arithmetic for the purposes of planning, keeping collective account and preparing progress reports. Account of the cotton required for the cloth. Comparison of speeds. Percentage of waste and evenness, calculating the averages of speed and of production. Use of fraction and practice in preparing the statement of loss and gain. Preparation of the statement of the work done by the class.

Sixth, Seventh and Eighth Grades:—The students of these grades should devote more time to weaving. Spinning will be carried on in the school for half an hour daily. Students can practise spinning at their homes also in order to achieve cloth self-sufficiency. Ordinarily the yarn spun by the first five grades should be utilised for weaving by the students of the Sixth, Seventh and Eighth grades. For the implementation of projects regarding the manufacture of cloth for the school, for the home and for himself, each student of the Sixth, Seventh and Eighth grades will have to weave 39, 45, and 70 yards of cloth respectively. Weaving is started in the Sixth grade. Only *dusuti* should be woven to begin with, while on the Seventh and Eighth grades, cloth of both types *dusuti* and *eksuti* should be woven. The students of these grades should be also taught dyeing and they should be required to manufacture cloth of various designs. In the first six months, they should be given double yarn for *tani* and when they have had enough practice, they may be given spun but starched yarn. Various kinds of looms, the pit loom and the frame loom should be used. For dyeing purposes, indigenous colours should be preferred. Different forms of cloth designs and dyeing processes should be experimented with. For spreading *tani* all the prevailing methods should be employed. The boys should have practical training in decorating and fixing looms. With a view to acquiring experience, every student should be made responsible for the management of the weaving section by turns. The students of these grades are expected to learn the following things. :—

1. Parts of the various kinds of looms, their size and uses.
2. Comparative study of various kinds of looms.
3. Assembling of the loom.
4. Estimate of the quantity of yarn required for *tani* and *bharni* of a certain size of cloth.
5. Difficulties of weaving and their solutions.
6. Classification of yarns for *tani* and *bharni*.
7. Finding out the number of "baya" and "rach".
8. Need for boiling of the yarn before starching.
9. Importance of 'Pati' and 'Punjam' in weaving.
10. Knowledge of thickness of thread as far as the *tani* is concerned.
11. Need for starching.
12. Importance of section in spreading.

13. Merits and demerits of using the doubled yarn.
14. Comparative study of foreign and indigenous colours.
15. History of the development of textile industry.
16. Origin of mills and the history of the decline of *khadi*.
17. Revival of *Khadi* and its development.
18. Indian mills and textile production.
19. Cloth producing centres of the world and study of their geographical situation.
20. Export and import of cloth.
21. Competition of *Khadi* and mill-made cloth.
22. Raw materials utilised in weaving and spinning and areas of their cultivation and production.
23. Plans for the village cloth sufficiency and suggestions for their implementation.

24. Finding out the thickness of the thread in calculating the yarn required for *tani*. Simple and decimal square roots. Work and speed in connection with weaving. Volume in connection with the fixing of the loom. The circumference and diameter of a circle profit and loss. Average ratio and proportion in connection with the mixing of colours.
25. Preparing a written plan of cloth sufficiency. Statement of weaving processes. Writing notes on the gradual development of looms, development of textiles and progress of *Khadi*. Study of selected books for the widening and strengthening of knowledge on weaving and allied subjects. Preparing an exhaustive list of terms used in spinning and weaving. The development of Hindi, Urdu and other Indian languages. Practical knowledge of grammar. Preparation of small lessons on spinning and weaving for children of lower grades.
26. Weaving processes. Effect of moisture on weaving, chemical properties of fibres. Heat and temperature. Preparation of colours and chemicals. Friction and its effect. Principles of lever and pulley.
27. Preparation of reecords; Painting of designing.

Assessment in Spinning and Weaving:—Students study spinning and weaving in order to attain self-sufficiency in cloth. Therefore, while assessing their progress in this work, the aim of attaining self-sufficiency in cloth should always be kept in view. The assessment should be based on the following :—

1. Examination of craft records of craft work properly maintained.

2. Test of skill at the end of the session.

3. Examination of the manufactured goods kept in the exhibition by the students. The students are required to maintain the record of their daily work. Collective record is prepared at the end of the month. The class teacher shall assess the work done in a month. The average of the monthly assessments should be considered as the final evaluation for the session.

There should be an arrangement to test the skill gained by individual pupils at the end of every session. In this test the output, speed, method, quality of the work done and other related things should be given equal importance. It should be so arranged that most of the processes of the craft work are included in the test. In the first three grades, the skill of the students in the following processes can be tested separately; cotton cleaning, cotton ginning, preparation of slivers, spinning, preparation of the *latti* or *gundi* and so on. But in the fourth and fifth grades, spinning as a whole should be taken at the test for skill. The time for such a test should be fixed in advance. The boys should be given a certain amount of cotton for ginning, carding and preparing slivers out of it. They should be asked to find out the strength and uniformity and count of the yarn and the resultant speed after they have spun a given quantity of cotton. They should also find out the wastage. Thus the record of the progress that each student has made will always be before the teacher as well as the student. All the processes involved in the test should be performed under the supervision of the teacher. Practical knowledge based on the craft processes can be tested both verbally and in writing. After the test, every student will be able to compare his skill with that laid down in the syllabus to discover the degree of his success. Moreover he will know what place he occupies among his classmates.

Like spinning, weaving should be taken as a whole for the purpose of the test. It should be so arranged that students take a certain quantity of cotton and manufacture cloth within a given time, performing all the processes required. For the test, the students should be divided into batches of two, because a single student cannot perform all the processes by himself.

At the end of the session, students should be given the opportunity to arrange an exhibition to exhibit the samples of their manufactured articles. Then these samples can be graded in terms of quality.

Ordinarily, the assessment of the work will be made by the teacher and the students, but in order to be sure of the correctness of the assessment a committee of at least five experts should be appointed by the authorities to re-examine the work. This will help to maintain correct standards.

CHAPTER I (b)

IMPORTANCE OF AGRICULTURE

Agriculture as a Basic Craft

Agriculture is the main occupation of the majority of the people of India and is closely related to the life of the people. Hence it is necessary to acquaint every child with all the processes involved in Agriculture.

For the success of the *Grow More Food* Campaign and for making this country self-sufficient with regard to food it is necessary to impart scientific training in Agriculture.

Agriculture as the main Craft helps to reduce the gulf between life at home and the life at school. At school children have opportunities to verify the things learnt at school. It also helps to make what has been learnt at school more concrete.

Agriculture helps the children to correlate effectively the other subjects they have studied at school. Children get the chance to observe different plants, birds, beasts, insects, etc. They are also in touch with Nature and thus derive a fair amount of knowledge in general science. While discussing the cultivation of various crafts, children learn a good deal about geography. Children also have to weigh, measure and sell the agricultural produce and have to prepare profit and loss account sheets and thus they learn arithmetic. Thus, children get ample scope to learn many useful things belonging to different subjects through Agriculture.

This craft helps to increase the productive capacity of the individual and enables him to utilise his leisure time advantageously. Thus, the true sense of dignity of labour is inculcated in children.

Collective work on the farm helps to create in growing children a keen sense of personal worth and a spirit of cooperation.

Content of Agriculture Syllabus:—Agriculture as a basic craft includes (1) Gardening, (2) Agriculture and (3) Allied Farming.

(1) *Gardening*:—It comprises (*a*) Vegetable gardening, (*b*) Fruit gardening and (*c*) Flower and decorative gardening.

(*a*) Vegetable gardening includes the growing of leafy vegetables, flower vegetables, fruit vegetables and root vegetables. (*b*) Fruit gardening includes the growing of fruits such as lemons, grapes, oranges, guavas, papayas, plantains, mangoes, etc. (*c*) Flower and decorative gardening includes the growing of common seasonal flowers, border plants, crotons, etc. for decorative and protective purposes.

(2) *Agriculture*:—It includes the growing of the local food crops, fodder crops, fibre crops etc.

(3) *Allied Farming*:—It includes activities such as Dairy, Poultry, Bee-keeping, Silkworm rearing, Fruit preserving, etc.

Method of Teaching

Systematic Observation:—The teacher should take the children on excursions to different places of interest in order to create in them love of nature and its phenomena. He should also arrange visits to local markets so that the children may see different vegetables, fruits, etc. available in the market at different seasons.

The teacher should also arrange visits to village fields and gardens to enable the children to observe different plants, flowers and fruits that are grown in different seasons as well as birds and insects that visit them. The teacher should encourage the children to collect specimens of different types of leaves, flowers, fruits and seeds for the class museum.

The teacher should give the children ample opportunities to observe various agricultural operations carried out by the farmers and the implements they use.

The teacher should also let the children observe the germination, growth, flowering and fruiting of plants grown in pots, boxes, beds and plots in the school.

Systematic Operation:—The teacher should supply pots, beds or plots to the children according to their age and level of maturity. The teacher should first demonstrate the proper method of carrying out the operations and then distribute the tools and materials required, while the children are at work. The teacher should supervise and guide them.

Scientific Experiments:—Experiments enable the pupils to learn by doing and to understand the principles underlying the various phenomena. Experiments are of three types, namely (1) Discovery experiments, (2) Appreciation experiments and (3) Mystery experiments.

The purpose of the discovery experiment is to find out what happens. The appreciation experiment deepens the appreciation of a fact already known, while the mystery experiment presents facts in a magic way. It is necessary to give facilities to children to perform scientific experiments pertaining to Agriculture.

While observing various living and non-living things and natural phenomena, while carrying out different agricultural operations and while performing scientific experiments children will ask many questions and they will gain much scientific information with regard to the agricultural craft.

Planning the Year's Work:—There are two main seasons for growing agricultural crops, namely (1) the *Kharif* season and the (2) Rabi season. The duration of the *Kharif* season is from the 15th June to the 15th October and that of the Rabi season is from the 16th October to the 15th February. In the *Kharif* season crops such as 'bajra', Pulses, ground-nuts, cotton, chillies, sun hemp, etc. are grown while in the *Rabi* season crops such as wheat, barley, gram, etc. are grown. The cultivation of these crops in the

dry farming depends on rains while in the wet farming it depends on irrigation. The operations connected with agriculture are divided into five parts, *viz.* (1) Preparation of land, (2) Sowing the seeds, (3) Inter-cultivation and care of crops, (4) Harvesting and (5) Storing and disposing of farm produce. All these activities have to be carried out at the appropriate time to avoid wastage. It is also necessary to devote adequate time to each one of these activities. The time-table of the Basic school should therefore be elastic.

To adopt Agriculture as the basic craft, the school should have adequate land and water facilities for the whole year. This will enable the school to grow different types of seasonal and perennial crops on the farm. While preparing a plan for the whole year, it should be remembered that any two crops of the same kind should not be grown one after the other on the same soil.

The goal of self-sufficiency with regard to vegetables and foodstuffs should always be borne in mind. It is necessary to introduce into Basic schools activities included in allied farming. The plan of work, will, of course, depend upon the nature of facilities available in the school. However, a rough plan is given below as a model for the successful growth of different crops, for the profitable use of agricultural resources, for reducing the cost of cultivation and increasing the yield from land. It is assumed that the first term of the school begins from the month of June after the summer vacation.

June

1. Manuring and *bakharing* the land.
2. Sowing paddy in specially prepared plots for seedling purposes.
3. Inter-cultivation and weeding of vegetable plots and giving manure mixture to the plants.
4. Giving oil-cake manure and sulphate to sugar-cane and preparing ridges.
5. Giving ammonium sulphate to ginger and turmeric.
6. Sowing the seeds of chillies, brinjals and tomatoes for preparing seedlings.
7. Sowing *kharif* Crops such as bajra, cotton groundnuts, double beans, sun-hemp etc.

July

1. Ploughing and carrying out various tillage operations of the land reserved for the *Rabi* season.
2. Preparing ridges and planting sweet potatoes.
3. Giving manure to the ginger and other crops.
4. Harvesting the vegatables that are ready.
5. Preparing plots for the seedlings of tobacco.
6. Transplanting the seedlings of chillies, brinjals and tomatoes.

7. Sowing the seeds of lima beans, lady's fingers and other varieties of beans.
8. Giving bamboo supports to the creepers of double beans.
9. Completing the sowing operation of the *Kharif* season.
10. Thinning the *Kharif* crops.
11. Inter-cultivation of the *Kharif* crops.
12. Transplanting the paddy seedlings.

August

1. Inter-cultivation of the *Kharif* crops.
2. Manuring and *bakharing* the land reserved for the *Rabi* crops.
3. Harvesting the vegetables that are ready.
4. Preparing tobacco seedlings and transplanting them.
5. Sowing cabbage and cauliflower seeds in beds for the sake of seedlings.
6. Cleaning and keeping ready wheat, gram and other *Rabi* crop seeds.

September

1. Inter-cultivation of the Kharif crops.
2. Preparation of the land reserved for the Rabi crops.
3. Burying the sun-hemp for green manure.
4. Sowing vegetables such as beet, carrot, sweet potatoes.
5. Sowing onion seeds in beds for preparing seedlings.
6. Harvesting vegetables that are ready.
7. Inter-cultivation of the tobacco crop.
8. Watching the *bajra crop*.
9. Reaping the *bajra* crop, making bundles and keeping them carefully.

October

1. Cultivation of sweet potatoes.
2. Preparing land for sugar-cane.
3. Sowing onions for seed purposes.
4. Cutting up the tops of tobacco plants.
5. Sowing leafy vegetables.
6. Harvesting vegetables that are ready.
7. Transplanting the seedlings of cabbage and cauliflower.
8. Reaping the paddy crop.
9. Watching the crop of *Kharif*.
10. Harvesting black gram and similar crops.
11. Sowing wheat and gram.
12. Harvesting the groundnut crop.
13. Picking cotton.

November

1. Ploughing the light lands of the *Kharif* crops.
2. Harvesting the sweet potato crop.
3. Cultivating potatoes.
4. Preparing land for sugar-cane.
5. Inter-cultivation and care of tobacco.
6. Transplanting the onion seedlings and sowing the garlic crop.
7. Sowing the beans and grams in the paddy fields.
8. Transplanting the seedlings of tomatoes and brinjals.
9. Transplanting the seedlings of cabbage, and cauliflower.
10. Sowing the *Robi* crops after clearing up some of the *Kharif* crops.
11. Harvesting Paddy crop.
12. Harvesting groundnut crop.
13. Picking cotton.

December

1. Ploughing the heavy land of the *Kharif* crops.
2. Crushing of sugar-cane.
3. Preparing ridges for sugarcane crop.
4. Cultivation of potato crop.
5. Inter-cultivation of onion and garlic crops.
6. Sowing the leafy vegetables.
7. Care of the tobacco crop.
8. Harvesting of cabbage and cauliflower crops.
9. Cleaning and storing paddy and *bajra*.
10. Picking cotton.

January

1. Ploughing the land and preparing bunds at proper places.
2. Storing manure.
3. Turning up the sweet potato creepers.
4. Cultivation of the sugar-cane crop.
5. Reaping the tobacco crop and its further operations.
6. Harvesting cabbage, and cauliflower.
7. Sowing beet, carrot and leafy vegetables.
8. Reaping the tur crop.
9. Watching the *Rabi* crop.
10. Reaping up the *Kharif* crop and harvesting it.
11. Disposing of cotton.

February

1. *Bakharing* the *Kharif* crop land.

2. Collecting the roots of the crops.
3. Levelling and bunding the land.
4. Harvesting the sweet potato crop.
5. Cultivation of the sweet potato crop.
6. Completing the cultivation of sugar-cane crop.
7. Harvesting the vegetable crops that are ready.
8. Sowing the leafy vegetables by rotation.
9. Reaping the tobacco crop.
10. Cultivation of the vegetables such as lady's fingers, pumpkins, etc.
11. Watching wheat and gram crops.
12. Uprooting the cotton plants.

March

1. Ploughing the land and preparing bunds at proper places.
2. Giving oil cake and sulphate manures to sugarcane.
3. Harvesting ginger, turmeric and potatoes and disposing of them.
4. Cultivation of leafy vegetables, lady's fingers, pumpkins, etc.
5. Harvesting tomatoes and brinjals.
6. Reaping wheat and gram crops and harvesting them.
7. Storing the seeds of wheat and gram.

April

1. Taking the manure out of the pits.
2. Burning the land for preparing seedlings of paddy.
3. Ploughing and *bakharing* the land.
4. Preparing bunds where necessary.
5. Giving oil cake and sulphate manures to sugar-cane crop for the second time.
6. Harvesting the onion, garlic and potato crops and storing them.
7. Sowing leafy vegetables.
8. Harvesting vegetables that are ready.
9. Storing the necessary quantity of corn and disposing of the remainder.

May

1. Preparing land by tilling and *bakharing* operations.
2. Manuring the land with cowdung and compost manures
3. Preparing the burnt land for paddy seedlings.
4. Sowing the leafy vegetables and carrot, ginger etc.
5. Harvesting the vegetables that are ready.
6. Preparing plots for the seedlings of chillies, tomatoes and brinjals.
7. Cultivation of the creeper type of vegetables.
8. Cleaning and keeping ready the seeds required for the *kharif* season.

Organisation of Teaching

The syllabus in Agriculture has distinct parts. The first part relates to the Junior grades I to V and second part to the Senior grades VI to VIII. In the Junior grades, Agriculture does not hold the position of a basic craft. During this period the aim should be to interest and instruct the pupils in the fundamental principles of soil management and plant growth. Thus this part is quite akin to the syllabus in General Science. In grades I and II children should be provided with pots or small beds for sowing seeds and performing various operations and for observing the germination, growth, flowering and fruition of plants. In the grades III, IV and V, children should be given a small plot of about an acre for growing different seasonal vegetables and other garden crops and note down the observations. In the Senior grades, the children can take up Agriculture as the basic craft. They are required to perform all the agricultural operations systematically and intensively and to acquire the theoretical and scientific knowledge that is relevant to these operations.

PART II

Gradewise Teaching of Agriculture.

Grade 1

1. Aims and Objectives of the Teaching of Gardening in the First Grade

(A) To acquaint the children with the names of the neighbouring animals and plants and the tools used by the people.

(B) To acquaint the children with the shape, size, colour and use of the fruits and vegetables grown in the neighbouring places in different seasons.

(C) To acquaint the children with the names of the main agricultural operations carried out by farmers.

(D) To give practical experience to children, of sowing seeds in pots or beds and carrying out operations such as watering, weeding, mulching, etc.

(E) To enable the children to recognise the different parts of plants—root, stem, leaf, flower and fruit.

(F) To enable the children to present an oral report in simple language on observations made and work done.

(G) To inculcate the spirit of corporate life.

(H) To imbibe the spirit of dignity of labour.

(I) To form good habits.

2. Procedure

Observation should be the main medium of instruction for the first five grades. Observation in the upper grades should, however, be of advanced character. For sound observation, frequent educational excursions to different places should be arranged. Excursions are generally of three types, *viz.* (1) Short interval excursions, (2) Long interval excursions and (3) Camping. The short interval excursions take from half an hour to three hours ; long interval excursions—one to three days and camping will mean night halts. There should be a good many short interval excursions and a few long interval excursions and campings in the Junior grades, while in the Senior grades, the number of long interval excursions and campings should be increased.

Morning and evening hours are better than the daytime for excursions and agricultural operations.

For systematic observations, the teacher should arrange educational excursions and visits to the following places.

Group A :—Trips to local surroundings such as the village pond or lake, the river, the valley, the hill, the dam, the canal, the jungle, the sea.

The teacher should choose as many places as possible from this group and should take the children to these places three times a year. There should be an interval of three to four months between two successful visits. Each visit should be of half an hour's to three hours' duration.

Group B :—Visits to local places such as the local market, the railway station, the sea shore or harbour, the agricultural depot, the veterinary hospital, the museum, the village fair, the exhibition, the circus, the zoo.

The teacher should take the children to the local market at least once a month ; to the railway station or harbour three times a year, if it is quite near and to other places once a year. Each visit should be from half an hour's duration to three hours' duration.

Group C :—Visits to village fields and gardens with a view to observing cattle shed, tools shed, farmers at work, well and water lifting arrangement, vegetable gardens, fruit gardens, flower gardens, farm groups, experimental farms, cooperative farms, if any.

The teacher should take the children to these places at least four times a year. There should be an interval of at least one month during two consecutive visits. Each visit should be from half an hour's duration to three hours' duration.

Group D :—Visits to school plots such as vegetable plots, flower plots, fruit plots, food crop plots, children's individual plots, collective plots, museum plots, experimental plots.

The teacher should take the children of the first grade to the above-mentioned plots belonging to the upper grade children and should direct them to observe the plants and operations systematically.

How to Arrange Excursions :—The teacher should inspire the children of this grade to elect one leader for excursions every month. The teacher with leader should first visit the place of excursion and should get the first-hand information about the place. Choice of the place is the main factor in an excursion. Then the teacher should obtain the permission of the Head᾿aster of the school and the owner of the place of excursion. He should decide how to make use of the observations in correlating the scientific knowledge of the agricultural craft prescribed for the grade. In order to arouse the interest of the children, the teacher should give a complete picture of the excursion. Then the children should be asked to divide themselves into groups of a convenient size and to elect their group leaders. The programme of the excursion should be chalked out by the teacher in consultation with the group leaders.

How to direct observations in the grade:—During excursions children should be given suitable directions to observe carefully different plants, birds, insects, beasts, the general layout of the countryside and the natural phenomena. Children should be asked to collect specimens of plants, leaves, flowers, fruits, seeds, samples of soils, stones, birds, feathers, nests, eggs, etc.

Use of the observations :—While observing things, children will ask questions pertaining to them and try to learn the why and wherefore of things. Upon return from the excursion, all collected samples and specimens should be arranged neatly in order. Then discussions pertaining to the children's observations should be held. This will help the children to assimilate knowledge and to remove wrong notions, if any. With the help of the children the teacher should write down the important points of their observations in simple sentences on the blackboard. This material can fruitfully be used by the teacher to provide practice in reading and writing for the class.

Practical

(1) *Sowing seeds* :—Each child should be given a pot or box or a ready-made bed. If a pot or box is given, the teacher should demonstrate and carry out the work of filling it up with the help of the children. While sowing the seeds the teacher should ask the children to note the distance between the two seeds and the two consecutive rows. Then the children should sow the seeds under his supervision and guidance and label the pot, box or bed. The label should contain the following information—(1) name of the child, (2) name of the crop, (3) date of sowing.

2. *Watering* :—The teacher should demonstrate the correct method of watering the pots, boxes or beds—he should explain the sprinkling method. The pots or beds should be watered once or twice a week according to the requirement of the plant. The teacher should clearly indicate the exact quantity of water.

(3) *Mulching* :—After the teacher has demonstrated the proper method of mulching the soil, the children should be asked to carry out the operation themselves. The teacher should supervise and guide the work of the children properly.

(4) *Weeding* :—The teacher should point out to the children the difference between the weeds and the plants and how weeds damage plants. He should also demonstrate the correct method of weeding and explain when weeding should be carried out and what care should be taken while weeding. After weeding, the teacher should ask the children to collect the weeds and put them into the compost or green manure pits.

(5) *Care of tools* .—The tools and equipment supplied to the junior grade children should be small and handy. They should be properly kept in the tools shed and issued to the children whenever necessary. The teacher should demonstrate the use of tools and equipment before they are actually used by the children. After completing the operations, the children should clean the tools and then return them. The storekeeper should not accept the tools or equipment unless they are quite clean. The tools sheds should be kept neat and tidy.

Theoretical

During excursions, the teacher should tell the children interesting stories about animals, plants and natural phenomena, and recite action songs on the observations. He should encourage the children to present oral reports about their observations in short but complete sentences and

to draw pictures of the vegetables, animals, birds, tools, etc. observed during the day. The oral reports of the children should be written systematically by the teacher on the blackboard. This should be used as reading material for the class. The teacher should prepare strips of separate sentences and ask the children to put up these strips in the proper order so as to make the original report. After this practice with sentences, the words of each sentence should be written on a small strip of cardboard and the children be asked to put up the strips of words so as to make a good sentence. After the children have learnt to read these words they should be helped by the teacher to recognise the letters and their sounds; the letters in each word should be written separately on small strips of cardboard. The teacher should then ask the children to put up these letters in the form of words that makes sense.

Besides providing the children with reading material, such exercises will be useful in the following ways :—

1. Children will have some idea of the general layout of the country-side and notice the effect of rain on it.

2. Children will be able to recognise the common food crops, plants and their parts; common vegetables, fruits and flowers grown in the locality in different seasons; the shape, size , colour and use of the vegetables and fruits observed in the market.

3. They will be able to tell the names of common tools and agricultural operations carried out by the farmers.

4. The children should be able to present oral reports in simple and complete sentences about the observations made and operations carried out.

5. They should be able to sing songs about common animals, birds, plants and operations and

6. To tell stories about animals, birds, plants and operations.

The teacher will also learn to keep the record of the observations made and operations carried out in the following form :—

Date	time	Place of observation or operation	Things observed or operations carried out.	Information about things observed or operations carried out

GRADE II.

1. *Aims and objectives* :—as outlined for Grade 1 but in more detail.

2. *Procedure* :—As for Grade I but in more details.

3. *Practical*

(1) *Sowing seeds* :—As for Grade 1.

The Children should be acquainted with the unripe and damaged seeds by touch, feel, colour, etc. They should be asked to remove unripe and

damaged seeds and other impurities from the stock of seeds.

(2) *Manuring* :—The teacher should demonstrate the correct method of applying the farm yard to the plot. Then the children should apply the manure to the various pots or beds under his supervision.

(3) *Weeding* :—As for Grade 1. The teacher should ask the children to find out one or two common weeds usually seen in the pots or beds and to find out the reasons for their spread.

(4) *Mulching* :—As for Grade 1.

(5) *Watering* :—As for Grade 1.

(6) *Transplanting* :—The operation of transplanting should be performed in the afternoon so that the seedlings may be protected from the sun. It should be particularly remembered to water the beds before the seedlings are taken out; otherwise the roots of the seedlings would be damaged.

While transplanting the seedling the direction of the wind should be taken into account. The seedl'ngs must get the protection of the ridge.

(7) *Control Crop Pests* :—The teacher should first demonstrate the correct method of collecting the pests. The children should then collect them under his guidance and supervision. The teacher should also direct the children to observe the caterpillar systematically, its shape, size, colour, movement, etc.

(8) *Collecting and Storing of Seeds* :—When the crop is ready, the teacher should tell the children how to select good fruits for seed purposes. Then he should mark out such fruits with the help of children, so that nobody should pluck them before they are quite ripe. When these fruits become ripe, the teacher should help the children to pluck them carefully, remove the seeds and preserve them.

(9) *Selecting vegetables which are ready for use* :—The teacher should first show the characteristics of the vegetable that is ready for use and then ask the children to collect such vegetables for sale.

(10) *General Care of Garden* :—The teacher should help the children to keep the garden neat and clean. The garden should be properly fenced with decorative plants and protected from trespassers and cattle.

Theoretical :—As in Grade 1 but in more detail.

Stress should be placed upon the elementary study of the parts of plants and their functions.

GRADE III

1. *Aims and objectives* —As outlined for Grade 1 but in more detail.
2. *Procedure* :—As for Grade 1 but in more detail.
3. *Practical* :—

(1) *Sowing seeds* :—As before.

2. *Transplanting* :—

(A) *Handling* :—Care should be taken that no roots and stemps are damaged while handling the seedlings. The seedlings should be kept in baskets gently and covered with wet cloth so as to protect them from the sun.

(B) *Spacing* :—Spacing between two seedlings and two successive rows depends upon the nature and the growth of the seedlings into plants. The teacher should give clear instructions about the spacing and should supervise and guide the operation aright.

(C) *Planting* :—Before planting the seedlings, the pots or beds should be properly watered to make the soil sufficiently wet so that the roots of the seedlings may remain intact and unharmed.

(D) *Watering* —After planting the seedlings, it is necessary to water the beds within four days and then once a week.

(E) *Protection from the Sun* :—If the seedlings are very delicate and the heat of the sun in excessive, the teacher should demonstrate the correct method of making a shed of leaves over the transplanted seedlings.

(3) *Weeding* :—As before, but the operation should be carried out faster and more carefully.

(4) *Manuring* :—As before.

Care should be taken to transfer all the waste material and rubbish to the manure pits ; wet and watery substances should be mixed up for decomposing the waste material into manure. Cow dung and urine help to decompose the dry rubbish. Water should frequently be sprinkled on it. When the pit is full, it should be properly covered. When the manure is ready it should be taken out of the pit and allowed to dry. Then it should be removed carefully to the plot for proper use without any waste. The teacher should help the children to perform all these operations.

(5) *Watering* :—(a) The teacher should point out to the children that excess of water is always harmful to the plant and soil. (*b*) The children should be acquainted with raised beds, flat beds and ridge beds and their uses and the methods of watering them. Seedlings which require less water at short intervals are generally sown in raised beds.

Leafy vegetables do not require much water and so they are sown in flat beds, but sugarcane and turmeric require much water: they are, therefore, sown in the ridge beds. While watering, care should be taken that the tops of the plants do not remain under water for a long time ; otherwise the crop will be damaged.

(6) *Control of Pests* :—As in Grade 11 but in detail.

Keep the caterpillar in the show case. Place an enlarged picture of it by its side showing the parts in detail.

(7) *Harvesting* :—As in Grade 11, but with more speed.

(8) *Marketing* :—The teacher should show the correct method of cleaning the vegetables and fruits picked up from the plot and of sorting them out according to their sze and colour. He should also demonstrate

the correct method of packing and arranging them for sale. Then the children should be asked to carry out all these operations systematically.

4. Experimental

(1) Object :—To observe the effect of weeds on the growth of plants.

Prepare two beds of the same size, side by side and sow either maize, beans or peas in both of them keeping the same distance between the seeds and the consecutive rows. Water and manure these beds at appropriate intervels. But keep the weeds undisturbed in one bed when they grow and remove the weeds at the right time from the other bed. Ask the children to observe the growth of plants in both beds from time to time and arrive at their own conclusions.

(2) Object :—To observe the effect of the manured and unmanured plots on the growth of plants.

Prepare two beds of the same size side by side and apply manure to one of these beds and leave the other unmanured, sow either maize, beans or peas in both the beds keeping the same distance between two seeds and consecutive rows. Water these beds at appropriate intervals and remove the weeds at the right time. Ask the children to observe the growth of the plants in both the beds from time to time and draw their own conclusions.

Similarly, the children should be given opportunities to perform experiments to show the comparative growth of plants under different conditions such as the effect of different amounts of water, air, sun, wind, etc.

(3) Object :—To find out the ingredients of garden soil.

Take some quantity of fresh garden soil and pour it into a glass jar, half full of water. Close the mouth of the jar with a cover and shake it vigorously until all the soil is suspended in water. Notice how the particles settle down. The children will discover that the first thing to settle down is a layer of sand at the bottom, then a layer of finer particles called silt and a layer of still finer particles called clay and finally suspended organic matter at the top.

5. Theoretical

Theoretical knowledge should be based on the observation, operation and experiments which the children have actually performed. The children should be asked to write down the record of the observations made, work done and experiments performed from time to time.

Grade IV

1. *Aims and Objectives* :—as outlined for Grade I but more detailed and advanced.

2. *Procedure* :—As for Grade I but more detailed and advanced.

3. Practical

(1) *Planning garden beds, paths. flower Borders, etc.* :—The teacher should show different types of gardens to the children. Then with the help of the children, he should prepare a plan of the class garden, with decorative beds, paths and borders; the children should execute the plan under his guidance and supervision.

(2) Upkeep of garden, paths, fencing, etc.

The teacher and the children should make themselves responsible for the upkeep of the garden by actually preparing the beds, sowing the seeds, watering the plants, removing the weeds and cutting the borders artistically. The borders of the beds and paths should be properly marked with bricks. The garden should be properly fenced, in order to protect it from stray cattle.

(3) Preparing Seeds Bed

Selection of site for the seed beds is an important thing. The bed should be within easy reach of water supply. It should be naturally protected from the sun and should be completely fenced. With these factors in view the teacher should direct the children to find a suitable place for seed beds and prepare a raised bed for sowing seeds.

(4) *Sowing flower and vegetable seeds* :—The teacher should first demonstrate the proper method of sowing the flower and vegetable seeds in the raised beds in straight lines. Then the children should be asked to perform the operation under his supervision and guidance.

(5) *Care of seedlings* :—

(a) *Watering* :—As in Grade III

(b) *Weeding* :—The weeds should be uprooted gently with the help of fingers; otherwise the seedlings will be damaged.

(c) *Thinning*:—If the rows are thick, the teacher should demonstrate the right method of thinning the seedlings.

(d) *Transplanting* —The bed of seedlings should be watered at least half an hour before transplanting, so that the roots may not be damaged.

(e) Seedlings should be dusted with wood ash to protect them from insects.

(6) *Propagating by other methods* :—The teacher should show to the children that plants such as rose, crotons and sugarcane are propagated by the use of cuttings. He should tell them how to prepare cuttings. Similarly the children should learn that there are certain plants which are propagated by the use of tubers. For instance, a piece of potato bearing an eye is planted. Thus potatoes are always grown from tubers. Lilies, Canna and dalhas are also propagated by the use of tubers.

(7) *Transplanting fruit trees* :—While making observations in a fruit garden, the teacher should point out to the children the distance between

successive rows of the fruit trees and the measurements of the pits used for transplanting these trees.

Serial No.	Names of the fruit tree.	Measurement of a pit.	Manure used	Distance between rows.
1.	Guava.	2′ x 2′ x 2′	2 baskets of cow-dung manure	15′
2.	Orange.	3′ x 3′ x 3′	3 baskets of cow-dung manure and 5 Lbs. of bone mill.	16′
3.	Lemon.	3′ x 3′ x 3′	3 baskets of cow-dung manure and 5 Lbs. of bone mill.	15′
4.	Papaya.	1′ x 1′ x 1′	½ basket of cowdung manure	8′

(8) *Watering* :—The teacher should first demonstrate the method of yoking and driving the "Mot". Then the children should be asked to carry out the operation under his supervision and guidance.

(9) *Weeding* :—The teacher should ask the children to observe the different types of hoes used by the farmers for different garden crops and select one for his own garden and carry out the operation.

(10) *Marketing* :—As in Grade III but more detailed and advanced.

(11) *Control of Pest* :—As in Grade III but in detail. Killing the caterpillars and insects by putting them in a pot containing rockoil.

4. Experimental

Repeat the experiments made in Grade III. The children should perform their experiments carefully, make accurate observations and draw their own conclusions.

5. Theoretical

(A) As in Grade III but more detailed and advanced.

(B) While spreading the gravel on the path and manure in the plot, the teacher should ask the children to find out the area of the path and plot over which gravel and manure were spread out.

(C) The teacher should make the children understand through observation that running water wears away rocks, carries along the stones and breaks them into smaller and smaller pieces. That extreme changes in temperature bring about tiny cracks in the rocks, that strong winds carry away rock dust, and that soil consists of sand, silt and clay. The children should learn the following things about soils :—

1. Soil consisting of coarse particles is called sandy soil.
2. Soil consisting of very fine particles is called clayey soil.

3. If in a soil, the proportions of sand and clay are equal it is called 'loam'. The teacher should show the following facts to the children.

1. Water runs through pure sand much more quickly than through pure clay.

2. Pure clay retains much more water than pure sand.

3. Loam combines the properties of both sand and clay.

It should also be shown that under natural conditions, where everything that grows from the soil finally returns to the same soil, the fertility of the soil is maintained and even improved. By cultivating different crops, one after the other, the greater part of the plant material is removed when the crop is harvested. Thus, instead of adding anything to the soil, certain essential mineral salts are exhausted. Therefore, for growing good crops, it is necessary to replace these mineral salts by adding manure to the soil.

Grade V

1. *Aims and Objectives* :—As outlined in Grade 1 but more detailed and advanced.

2. *Procedure* :—As before but more detailed and advanced.

3. *Practical* :—As before but more detailed and advanced.

4. *Experimental* :—Each child should be encouraged to perform the experiments as follows :—

Object :—To observe growth of plumule and radicle.

Things required :—Glass vessel, blotting paper, damp sand or saw dust and beans.

Take a glass vessel, lined with blotting paper and filled with damp sand or saw dust. Put the beans between the glass and the blotting paper. Keep the vessel in a safe place and observe daily all the changes that take place in the beans.

The children should be asked to note down the changes from time to time. They should draw pictures of the daily growth of the plant.

5. *Theoretical*

(A) The children should be asked to keep records of observations, operations and experiments neatly and accurately.

(B) Study of Soil—(a) Sandy soil soaks water immediately ; it has no water-holding capacity ; it becomes hot very soon and also cools down soon. Therefore crops do not grow well in sandy soil. (b) Clayey soil soaks water slowly, its water holding capacity is more and hence crops grow normally in this soil.

(C) While using different garden implements, children should be asked to observe their shape and utility and note down the information accurately in the following form.

Name of Implement	Shape	Measurement	Use
1. Khurpi.			
2. Hoe.			
3. Rake.			

(D) Study of Manure and Compost :—When the children apply different types of manures to their plots, they should be given an idea about the contents of these manures. They should note down these facts in their notebooks :

Name of Manure	Composition
1. Cowdung Manure 2. Sheep Manure 3. Compost Manure	

(E) While preparing water channels for irrigation, children should be asked to observe the exact places of the channel where water is absorbed and to find out the reasons for this absorption.

(F) Control of Crop Pests :—As before, but in greater detail.

(G) Study of plants :—As before, but in greater detail.

(H) All the specimens collected during excursions should be arranged properly and the best ones should be transferred to the school museum after putting labels on them.

Grade VI

1. *Aims and Objectives* :—As outlined in Grade I but more detailed and advanced.

2. *Procedure* :—As before but more detailed and advanced.

3. *Practical*

(A) Intensive agriculture begins from this Grade. Children have to perform all the heavy operations themselves under the supervision and guidance of the teacher. After manuring the plot, the teacher should first demonstrate the proper method of yoking the bullocks to the *bukhar* and of driving it. Then the children should be asked to carry out the operation by turns and thus prepare the land for cultivating field crops such as wheat, jowar, cotton or gram etc. In the same way, operations such as sowing, inter-cultivation and weeding harvesting and thrashing should be carried out at appropriate intervals.

After carrying out their observations and operations, the children should note down information as follows :—

Name of the field crop	Soil	Season	Rain in inches	Seeds per acre	Pests or diseases.
1. Wheat 2. Jowar 3. Cotton 4. Gram					

The teacher should also tell them about persons who won the title of "*Krishi Pandit*" by producing the maximum yield of the crop per acre and thus encourage them to work on the right lines.

(B) Control of Pests :—As before but with greater efficiency.

(C) Surveying of a Field :—Children should be given practice in survey work by using (1) plane table, (2) spirit level, (3) compass needle, (4) flag staff, (5) chain or tape and (6) angle measurer. The teacher should help the children to measure the agricultural plots assigned to different grades. They should also practise preparing maps of the plots to scale out the area of the plots.

(D) Cultivation of Trees :—The teacher should properly demonstrate the method of propagation by "gooty" and layering. Then each child should be asked to practise the same operation on guava, rose and such other trees.

(E) Animal Husbandry :—The school should have a dairy unit of its own, otherwise the teacher will have to take children to the neighbouring farms for observing the animals daily and for different operations. The children should write down their observations and experiences as follows: —

Variety of the Dairy Animal	Shape, size, colour and identification marks.	Food supplied	Milking Capacity

4. *Experimental*

(1) Object :—To show the working of stems and veins in distributing water among the various parts of the plant.

Things required :—One flask, one plant having stem, water and red ink.

Arrangement :—Take a flask half filled with water. Add some red ink to the water contained in the flask. Put the plant gently in the flask in such a way that roots remain completely under water. After three to four hours, the children should be asked to observe the stem and veins minutely and to draw their conclusions. Ask the children to repeat the same experiment at home with other plants.

(2) Object :—To show the effect of light on plants.

Things required :—Two similar pots, seeds, soil and water.

Arrangement :—In each of the pots put some soil. Sow the seeds similarly and sprinkle water sufficiently. Then place one pot inside a dark room and the other outside in the light. After eight days, ask the children to compare the seedlings grown in the two pots and find out the difference. Ask them to write down their conclusions in the following table :

Name of the seedling	Colour	Size and colour of of leaves	Size of stem
1. Seedlings in the dark. 2. Seedlings in the light.			

(3) Object :—To prove the need for crop rotation

Select two neighbouring plots and sow grain crops in both the plots in the *Kharif* season. Carry out all the operations in time and harvest both the plots at the end. Then, in the *Rabi* season, without manuring these plots, sow some grain crop again in the first plot and leguminous plants in the second plot. Carry out all the operations in time and harvest both the plots. Then in the next *Kharif* season, sow some grain crop again in the first plot and the same in the second plot and observe the growth of the crop in both the plots and find out the difference.

Grain crops absorb more nitrates from the soil than other crops and thus exhaust the supply of nitrogen compounds in the soil. Hence, if grain crops are sown again and again in the same plot, poor crops are obtained. On the other hand, if leguminous plants are grown after a grain crop, the nitrogen fixing bacterial living in their roots will increase the amount of nitrates in the soil. It is, therefore, always beneficial to practise crop rotations.

5. *Theoretical*

(1) Planning the year's work ahead :—The following factors should be kept in mind while preparing a plan.

(a) Extent of land and division of land into proper plots.

(b) Irrigation facilities.

(c) Crops to be grown in different seasons according to the need of the community.

(d) Month-wise operations to be carried out for the proper cultivation of the crops.

(e) The number of children in the grade.

(2) Study of Soil :—As before, but more detailed and advanced.

(3) Study of Green Manure :—Green manures are usually rapidly growing plants. Their stems are delicate. When these plants are buried in the soil they decay and enrich the soil with humus. Sun-hemp belongs to this type of manure. If leguminous green plants are dug into the soil, they also decay and enrich the soil with all the important nitrates. Where the decay is rapid, the green plants shoruld be buried in the soil only a short time before planting the next crop.

(4) Study of *Bakhar* :—Children should observe the *bakhar* and its parts and while actually operating, they should study the functions of the various parts of the *bakhar*.

(5) Measuring Area :—As before, but more detailed and advanced.

(6) General Principles of Feeding, Housing and Care of Animals :—If there is no dairy in the school, the teacher should take the children on an excursion to a model dairy in the neighbourhood and ask them to collect the requisite information and record it properly.

(7) Study of Cattle Diseases :—Give opportunities to the children to

observe the foot and mouth diseases and collect information about it and record in the following table :—

Name of the Disease	Symptoms	Causes of its spread	Preventive Measures	Treatment

(8) Study of Plants :—As before but more detailed and advanced.

(9) Propagation :—As before but more detailed and advanced.

(10) Reading Magazines :—The school should subscribe to suitable magazines on Agriculture and provide ample material for reading. Interesting experiments should be brought to the notice of the children. Small pamphlets on various topics of Agriculture published from time to time should be kept in the library for supplementary reading.

(11) Arranging the museum :—As before

Grade VII

1. *Aims and objectives* :—As outlined in Grade 1 but more detailed and advanced.

2. *Procedure* :—As before but more detailed and advanced.

3. *Practical*

(A) Let the children in this grade carry out all the operations starting from preparing the land to the harvesting of the crops. They should be able to grow garden crops on a large-scale according to the need of the school. The teacher should demonstrate, supervise and guide the operations of the children whenever necessary.

(B) Give them opportunities to observe the operation of ploughing with modern and *Deshi* ploughs. Give them practice in using, dismantling and refitting the same.

(C) Let them grow field crops to conserve soil fertility.

The children should adopt the typical three-year crop rotation which consists of the following :—

(i) Cultivated crops such as cotton, and sweet potatoes. Vegetables have deep roots and take in mineral salts from deeper layers of the soil.

(*ii*) Small grain crops such as rice, fodder crops like Nilwa ; grasses have shallow root systems and absorb their food material from the top layer of the soil, left almost untouched by the deeper roots referred to under (*i*) above.

(*iii*) Leguminous plants such as peas, beans, groundnuts, grams, etc. if buried in the soil by ploughing for green manure purposes, increase the supply of humus and also enrich the soil with nitrates.

(D) Care of Tools and Simple Repairs :—Remember that the repairing of tools in time prolongs the life of the tools considerably. Keep them clean, neat and tidy. Protect them from the sun, rain and wind.

(E) Preserving Fruits and Vegetables :—If there is an ample supply of fruits and vegetables in the market, the rates are lowered considerably. In such circumstances, it is necessary for the teacher to demonstrate the proper method of preserving fruits and vegetables by drying and salting methods. Afterwards, the children should themselves carry out these processes.

(F) Dairy :—As before but with greater efficiency and skill.

(G) Pruning :—For the proper growth of plants and for decorative purposes it is necessary to prune the fruit and flower plants, hedges and borders. Children should be given practice in this operation.

(H) Collecting Specimens for School Museum :—As before but of an advanced nature.

(I) Selection of Good Seeds :—The teacher should help the children to prepare a trial plot and sow the selected seeds and carry out further operations carefully in time. When the crop is ready, good plants should be marked and harvested. The seeds thus obtained should be stored properly for sowing purposes.

4. *Experimental*

(1) As before

Show by a proper crop rotation the following advantages :—

(*i*) It removes the mineral constituents of plant food evenly from all parts of the soil.

(*ii*) It helps to control weeds.

(*iii*) It improves the condition of the soil.

(*iv*) It starves out harmful insects and plant diseases.

(2) Show the correct method of preparing insecticides and fungicides and of sprinkling and spreading the same.

Show how to prepare different mixtures such as bordeaux mixture, lime-sulphur mixture, formaline mixture.

(3) Show that salt is not congenial to the growth of bacteria. Salt is therefore used for preserving fruits. Fruits such as grapes, mangoes, plantains are dired up and preserved for a long time. Cowdung ash and powdered sulpher are used for preserving seeds.

5. *Theoretical*

(1) Records :—As before

(2) Planning :—As before

(3) Keeping simple agricultural records and accounts.

(4) Detailed Study of Chief Field or Garden Crops :—Through observation, experiments and operation, the children should gather information and note it down as follows :—

Crop	Soil	Season	Seeds per acre	Produce per acre	Pests	Refined variety
1. Wheat						
2. Rice						
3. Jowar						
4. Bajra						
5. Cotton						
6. Ground-nut.						
7. Sugar-cane.						
8. Potatoes						
9. Chillies						
10. Brinjals						
11. Grams etc.						

(5) Rotation of Crops : As before.

(6) Principles of Cattle Breeding :—As before but more detailed and advanced.

(7) Study of Plants—in particular Fruits and Seeds :—Through observation, all the fruits can be conveniently grouped into **two** main classes:—(1) Dry fruits and (2) Fleshy fruits.

The real function of fruits and seeds is (1) to reproduce the plant, (*ii*) to multiply the plant and (*iii*) to propagate the plant.

(8) Surveying etc. :—As before but more detailed and advanced.

(9) Preservation of Fruits and Vegetables :— As before but more detailed and advanced.

(10) Common Cattle Diseases and Their Treatment :—As before but more detailed and advanced.

(11) Reading Agricultural Pamphlets and Magazines :—As before.

Grade VIII

1. *Aims and Objectives* :—As outlined in Grade I but more advanced in nature.

2. *Procedure* :—As before but more detailed and advanced.

3. *Practical*

(A) Raising of Field Crops on Imporved Lines :—Children should be given an insight and experience in the improved type of agriculture. They should be given opportunities to grow various crops individually as well as collectively with full responsibility.

(B) Marketing :—Children should independently harvest the different vegetables and fruits grown in their plots. All the activities from grading

to selling should be carried out by the children themselves. They should keep accounts of the same.

(C) Dairy Work :—As before but with greater efficiency, ease and skill. Study of the important local breeds of cattle with respect to their main characteristics, merits, drawbacks. Special study of feeding, housing, treatment of ailments, processing the daily produce into butter, ghee and curds, cleaning utensils and feeding the cattle.

(D) Growing in Trial Plots Selected Seeds :—As before.

4. *Experimental*

1. Object :—To study the growth of plants with different amounts of manure.

2. To find out the proper frequency of irrigation and amount of water.

3. To study the effect of improved seeds on the crop produce.

4. To study the advantages of crop rotation.

5. Theoretical :—As before but more detailed and advanced.

Records :—Record No. 1 :—Individual Diary

Date	Operation carried out	Knowledge derived.

Record No. 2 :—Crop-wise Record.

1 Name of the crop :—
2 Area under cultivation :—
3 Date of sowing :—

Operation	Human labour	Animal labour	Other charges	Total Expenditure
1. Preparing Land 2. Sowing 3. Inter-cultivation 4. Harvesting 5. Disposing of				

Record No. 3 :Farm Enterprises

Name of Crop	Area	Yield Per Acre.	Total Yield	Rate of Sale Per Maund	Total Cost.

BILL FORM

Date...................... No.

Mr....................................

Particulars of materials	No.	Quantity		Rate per Lb.			Amount			Remarks
		Seers	Ch.	Rs.	As.	Ps.	Rs.	As.	Ps.	

Note :—Payment of this bill may kindly be made promptly.

Signature of Salesman.

DELIVERY MEMO.

Date	Name of the material	Weight just after harvest	Weight when dried up	Remarks

Food and Fodder Register

Date	Previous Balance		Quantity Purchased		Quantity Received from the Farm		Total Quantity		Quantity used up		Quantity left	
	M.	S.	M.	S.	M.	S.	M.	S.	M.	S.	M.	S.

Weekly Muster Roll

S. No.	Name of the person	Sun.	Mon.	Tue.	Wed.	Thurs	Fri.	Sat.	Rate	Amount
	Signature of person									

Live Stock Products.

Monthwise	Sale of Milk	Total Products sold			
Month	Pounds	Products	Amount		
			Rs.	As.	Ps.
		Milk sold wholesale			
		Milk sold by retail			
		Butter Milk			
		Butter . .			
		Ghee . . .			
		Eggs . . .			
		Hatching Eggs .			
		Chickens . .			
		Manure . .			
Total					

Dead Stock Register

No.	Name of the article	No. Purchased	Price per article			Total cost			From whom received	Date of receipt	Remarks
			Rs.	As.	Ps.	Rs.	As.	Ps.			

Stock Book

Date	Day Book Page No.	Previous Balance		Received from the farm		Quantity purchased	Amount			Sundry	Total Quantity		
		Mds.	Seers	Mds.	Seers		Rs.	As.	Ps.		Mds.	Seers	

Date	Day Book Page No.	Sale		Amount			Transferred		Use for seeds		Waste		Quantity used up		Quantity in Balance	
		Mds.	Seers	Rs.	As.	Ps.	Mds.	Seers	Mds.	Seers	Mds.	Seers	Mds.	Seers	Mds.	Seers

Hints regarding time-table :—

The craft work should not generally be taken up at one stretch, but the whole time assigned for the craft should be divided into three to four periods each being more than 30 minutes. As far as possible a new type of operation in craft work should be undertaken in each period. Each operation should be properly correlated.

At the beginning, there should be a general *safai* of the school, then an assembly meeting and the reading out of the daily news. The Head of the Institution should explain the programme of the day. Then the class teacher with the children should carry out *safai* of the classroom, the equipment, water pots, decorate the class properly, clean and fill the pots with drinking water, carry out the health, hygience and cleanliness inspection and discuss these items with the children. The teacher should previously plan the portion of the syllabus that has to be correlated with craft work, community life, social work and cultural activities. He should plan the various activities with the help of the children at the beginning and later on the children should be asked to plan the activities independently.

Monthwise planning helps the teacher a great deal in correlating various subjects.

Planning for the Month of March is given below as an illustration :—

Operations in Agriculture.	Activities related to the natural environment	Activities related to the social environment
1. Ploughing		1. Excursion.
2. Bunding	2. Winter coming to an end & its effects on plants, animals & men.	2. Picnic.
3. Giving manure and oil cake to the sugar-cane crop.	3. Advent of spring, its effects on plants, animals and men.	3. Sports meets.
4. Planting lady's fingers, leafy & other vegetables.	4. Observing the Sun, Moon and the constellations.	4. Village fairs.
5. Harvesting wheat, grams and jowar crops.	5. Observation of the weather.	5. Marriage ceremonies.
6. Harvesting potatoe and ginger crops and selling them.	6. Daily routine.	6. Community meals.
7. Storing seeds of wheat, gram, jowar, etc.	7. Prayer and worship.	7. Harvesting season of Rabi crops.
8. Preparing land for paddy .		

Similarly, the teacher should plan for the remaining months in advance.

The teacher should chalk out a time-table containing the agricultural operations and the subjects to be correlated. However, this time-table should serve as a guide and should be quite elastic. The daily routine should depend on the needs and nature of agricultural operations, the social work undertaken and the cultural functions to be celebrated.

Chapter I (c)

PAPERWORK, CARDBOARD WORK, WOODWORK AND METALWORK AS BASIC CRAFTS.

There are five methods of craft teaching, namely, demonstration, description that may be oral or written, discussion and discovery. Demonstration involves showing a technical operation; oral description in the telling method; written description implies reading of some books, instruction sheets or using other teaching aids; discussion means oral exchange of ideas between teacher and pupils and discovery signifies finding the solution to a problem the pupils are confronted with. In a single teaching unit, the teacher can apply one or more of these methods as the situation demands or allows. But, whatever the method, it is generally applied in four successive steps, namely, introduction, presentation, assignment and assessment. The first of these is the introduction which serves to prepare the ground for learning by arousing the interest of the pupils in the work to be done. When the necessary ground is ready, the teacher presents the material to be learnt. This done, the work may be assigned to the pupils for performance. And lastly, evaluation is made of what the pupils have learnt or acquired.

In carrying out a plan of work the craft teacher should bear the following points in mind :—

1. There must be specimens of finished articles, models, pictures and other exhibits available in the school to create interest in pupils; (b) tools, equipments and other teaching aids; and (c) raw materials necessary for class work. (2) The instruction that can be given through the exhibits should be planned in advance. (3) The manual skills that can be developed or the operations that are involved in the making of each model should be noted down. (4) The instructions that can be given through the operations should be clearly understood; (5) Arts, crafts, projects or activities that the model leads to and, what can be incidentally taken up should be identified. (6) Attitudes, understanding and qualities of the mind that can be cultivated or virtues that can be developed for the formation of good character should be explored. In fact, the making of a model should be treated as a process of learning rather than a mechanical activity, if the craft is to be used as an educational medium. The total effect produced on the pupils is the yard-stick to be used for the measurement of the teacher's success. This requires careful planning of work, before the actual teaching is started. This can best be done by the teacher, if he himself makes each model before introducing into the class and simultaneously studies step by step the educational possibilities of the work.

With these points in view, let us take up as an an illustration, a model lesson on the making of a propeller in paper work.

For the teaching plan, the teacher can tabulate or arrange, notes and materials under the aforesaid heads as follows :—(1) Exhibits, Tools, Raw Materials etc.

(a) *Exhibits.*

(*a*) A plain propeller revolving clockwise.

(*b*) A plain propeller revolving anti—clockwise.

(*c*) A propeller decorated by painting.

(*d*) A propeller decorated by papercutting.

(*e*) A propeller decorated by marbling.

(*f*) Illustration or model of an anemometer.

(*g*) Illustration or model of a windmill.

(*h*) Illustration or model of a turbine driven by water current.

(*i*) Illustration or model of an aeroplane.

(*j*) Illustration or model of a boat or a ship with sail.

(*k*) A paper glider.

(*l*) A kite.

(*m*) Papers of different kinds like tracing paper, carbon paper, blotting paper, cover paper, manilla board, strawboard, sand paper, papers of different sizes like foolscap, crown etc., of different colours.

B. Tools.	*C. Equipments.*	*D. Raw materials etc.*
Scale	Bowl for water	Pin
Pencil	Napkin	Stick
Setsquare	Wastepaper	Flour
Dividers	Oven Glue	
Protractor	Pan	Gum
Scissors	Weighing balance	Paper
Knife etc.	Measures	Strawboard
	Thermometer etc.	Fuel etc.

(2) Instructions to be imparted through exhibits. Note : The talk should be short and simple, the object of the instruction being to create interest. More detailed studies may be made when pupils take to making any exhibits.

Ref. of Exhibits	*Subject matter*	*Instruction*
(a)	Flower, star, star-fish etc.	When describing the shape of propeller, its likeness with some flowers, star, star-fish etc., may be pointed out It may be demonstrated that such flowers alo revolve like the propeller. Simple study of the flowers, star etc. may be made in this connection.

Ref. of Exhibits	*Subject matter*	*Instruction*
(b)	Study of Clock .	Knowledge of "clockwise" and "anti-clockwise" improvement may be imparted and how to read a clock taught. Also the pupils should be made to see that a propeller revolves only in one direction. Explain the reason in a simple way.
	Sun, Moon, Stars .	Some idea that all the heavenly bodies move in a definite direction, along definite paths, and follow a definite law and order may be given.
	Study of wind	By demonstrating that the propeller works only when it is placed against the wind and that wind blows in a certain direction. The direction changes with a change of season. Showing that the velocity of the wind varies and is very high during storms. Mention whirlwinds.
	Convection .	Children may be taught by demonstration that a propeller revolves when held over a fire; that hot air ascends upward.
(e)	Study of colours .	When the blades of the propeller are of different colours, a compound colour results when the propeller revolves fast. Thus green is the resultant colour when the blades are blue and yellow.
(f)	Velocity of wind. .	An anemometer and a propeller are very much alike inasmuch as both are put in motion by the wind. The idea that the velocity of the wind can be measured by anemometer may be conveyed.
(g)	Mechanical energy .	A cardboard model of windmill that works in the wind will be of great advantage to serve as a visual aid for the understanding of the mechanical principle underlying the operation of a windmill and particularly of the fact that air is a great natural power which may be and has been harnessed for various purposes with the help of devices like the windmill. Illustration of windmills in use in different countries are helpful.

Ref. of Exhibits	*Subject matter*	*Instructions*
(h)	Do. . .	The turbine is operated by water-current as motive power. The pupils should be made alive to the huge possibilities of obtaining power from water current. Give them some idea of the river projects in India.
(i)	Do. . .	The propeller is used in aeroplanes, but, for it, motive power is not derived from air or water but from a motor. The point of exhibiting the windmill and other exhibits of that type is not to teach the intricacies of mechanics or the details of science but to draw the attention of the pupils to the varied uses and properties of air and water—two important elements of Nature.
(j)	Mechanical Energy .	In the case of a boat or a ship sailing with the help of sails, the motive power is the wind. Again in the case of a paper glider or a kite, the driving force is the wind. The wind is so powerful but we cannot see it ; we can only feel its presence. The tremendous strength of the wind can be realised during a storm.
(m)	Number . .	Pupils should be asked to arrange papers in order of size or thickness and count them. Numbers may be written on the coloured papers so that a knowledge of figures is acquired from their association with the corresponding colours.
	Colour . .	The children may be asked to name things from nature, having the shade of colour of a particular paper or to collect such things for an exhibition.
	Language . .	The names of colours may be written on the blackboard as well as on sheets of coloured paper, and the students may be asked to find the particular sheet, the colour names of which are written on the blackboard. This, they will do by comparing the forms of words written on the board and the sheets of paper. This is an example of how reading can be initiated meaningfully.

(3) Practical operations involved in the making of the propeller.

(*a*) Measuring a piece of paper.

(*b*) Examining the corners with a set-square.

(*c*) Marking two points on the two edge lines at the same specified distance from the corner.

(*d*) Drawing two straight lines at right angles to the edges on the two points using the set-square and pencil. (The teacher will demonstrate and help if necessary)

(*e*) Cutting out the square piece of paper so formed.

(*f*) Folding the square paper twice diagonally.

(*g*) Measuring a piece of strawboard $1'' \times 1''$.

(h) Marking out.

(*i*) Cutting out the square piece of strawboard with scissors. (The teacher will help).

(*j*) Measuring water, weighing flour and preparing an emulsion of the two.

(*k*) Firing the oven. (The teacher will do it).

(*l*) Boiling the emulsion to prepare paste. (Stir the solution constantly).

(*m*) Applying the paste on one side of the piece of strawboard.

(*n*) Pasting the piece of strawboard on the centre of the paper so that the corners of the former fall on the diagonal lines of the latter.

(*o*) Cutting with scissors the paper from each of its covers to the corresponding corner of the piece of strawboard along the diagonal lines or fold-marks.

(*p*) Turning in alternate corners and fastening them with paste on the piece of strawboard so that the vertical points of the corners meet at the centre.

(*q*) Piercing a pin through the centre of the piece of strawboard and fixing the pin at the end of a stick.

(4) Instructions through operations.

Ref. of Operations.	*Subject Matter*	*Instructions*
(3) a	Number, inch, foot etc. straight and curved line, angle, right angle, rectangle etc.	The scale is introduced and units of measuring distance between points are taught. Different objects—books, slate, bench etc. are measured. The concept of dimensions can be conveyed to advantage. The ideas of the rectangular shape of paper, straight line, curved line, angle, right angle, etc. are given and the terms, length, breadth, height or thickness are taught.

Ref. of Operations.	*Subject Matter*	*Instructions*
(3) b	Acute and obtuse angles, triangles etc.	The set square is introduced. Its 45° and 90° angles and triangular shape are shown. That corners of paper or other objects which are less than 90° are acute angles, and those that are greater than 90° are obtuse, is taught. Some knowledge of the materials, e..g., plastic etc. of which set squares are made may be imparted. The teacher can ask a question like "Can you name things made of this material ?"
(3) c	Points, centre radius, diameter, circumference, parallel lines etc.	This operation can be effected with either dividers and scale or with the latter alone. If the dividers cannot be properly used by the children, the teacher will show how, for such operations, dividers are used, how circles are drawn, the distance between two points found etc.
(3) d	Perpendicular square etc.	Even though some children are found to be unable at this stage to draw perpendicular lines, it is not difficult for them to understand the meaning of the perpendicular. The difference between a rectangle and a square may be taught.
(3) f	Diagonal, how to divide a square into 2 and 4 equal triangles.	A square piece of paper when folded once diagonally, triangles are formed which are equal in all respects, and when folded twice the four triangles formed are also equal.
(3) k	Evolution of firemaking.	The story of the evolution of firemaking beginning from producing fire by striking one piece of stone against another to the modern cigarette lighter may be told. The story of primitive man is, in this connection, relevant.
	Coal mines .	With the help of a map the important places in India where coal is available may be shown and a simple story of coal told. Other fuels may also be discussed.
	Smoke . . .	That smoke is a nuisance and smoking is bad for the health may be pointed out.

(3) i Boiling of water . Explain that the solution becomes thicker and thicker by boiling because water boils away as steam and flour is left behind. Show by thermometer, if available, that the boiling point of water is 100° C and constant and that water cannot be heated to more than that temperature. Demonstrate how the mercury column of the thermometer rises and falls with the rise and fall of temperature respectively and explain by stating that mercury expands or contracts with changes in temperature. An interesting experiment may be made by boiling water in a paper bag. This is possible because paper does not burn at 100° C. Make the pupils understand the difference between steam and smoke.

(3) m Cleanliness . . Training in cleanliness may be given in connection with the work with paste.

(3) n Square . . . When both the pieces of cardboard and paper are perfectly square, the corners of the former fall on the diagonal lines of the latter. Knowledge of this enables them to detect irregularity, if any.

(3) p Angles . . . Questions like "how many obtuse, acute and right angles are formed" may be put to recapitulate the study of angles.

(3) a Knowledge through Tools and Materials: When pupils are learning how to measure paper or when different kinds of paper are introduced to them as exhibits, they may be taught that Foolscap, Demy etc. are names of different sizes of paper, that 24 sheets make one quire and 20 quires make a ream. Further, details like size, thickness or poundage, colour, strength, non-absorbability etc. may be discussed. Some idea of how paper is made and the evolution of writing materials may also be given.

(3) b, c, d. Care in the use of dividers, set square, pencil, and scissors: Names of different parts of scissors should be learnt by the children. They should know that for longer cuts with the tool, one should start cutting from a point (on the cutting edge) as near the fulcrum as possible, they should also understand in what cases cutting with the tip of scissors is necessary; questions like, "Can you name any tool that has a fulcrum like that of the scissors" may be put. The simple story of the evolution of tools—those made from wood and bone by primitive man to the gigantic and complicated machines of the modern age—may be narrated.

(3) g A simple account of strawboard may be given and familiar things made of strawboard named

(3) j Care in the use of the weighing balance and weights, knowledge of *Tola*, *Chhatak*, Seer etc., names of the parts of the weighing balance. Pupils may be asked to weigh flour of a given quantity. Here, for sense training the teacher can also ask them to estimate the weights of a given quantity of flour without weighing, study of flour, the resemblance of wheat with paddy, barley, etc. may be undertaken and staple food crops discussed. The students should find out what consistency of the mixture of flour and water is appropriate for paste-making.

5. Arts, Crafts, Projects of Activities etc.

(*a*) Decorating with colour and brush—Exhibit.

(*b*) Papercutting.

(*c*) Making and sailing a paper boat.

(*d*) Making and flying a paper glider.

(*e*) Drawing and painting on subjects having direct or indirect relation with the exhibits, operations, tools etc.

(*f*) Arranging an exhibition of the finished propellers, exhibits showing propeller making stage by stage, kites, gliders and other craft work, drawings and paintings, collection etc. by the pupils.

(*g*) Visiting farms and farmers to study wheat, rice etc. and their cultivation. Observation of various things of Nature, contacts with members and institutions of the village society etc. may be made in the course of this project.

(*h*) Visiting gardens or places to study and collect particularly night jasmines, periwinkle etc. that are similar in shape with that of the propeller. Study and collection of other flowers, leaves, etc. may be made in this connection.

(*i*) Collecting different specimens of paper, pictures, photographs, and illustrations of windmill and other exhibits, evolution of firemaking etc.

(*j*) Decorating the house or gate or garden etc. of the school using propellers of different sizes and colours as one of the types of materials for decoration.

(*k*) Blindman's 'buff'—Papers of different kinds as mentioned in Exhibbits 1(m) may be presented, one piece at a time, to a pupil, when his eyes are kept closed. He will examine each piece of paper by the sense of touch and say what paper is presented to him. Marks may be given for this.

(*l*) Going to a bazar or fair to sell the propellers as study commodities, fruits, vegetables, etc. available there, and also transportation, dresses of people etc.

(*m*) Commenting on the quality of workmanship of the exhibits.

(6) Attitudes, understanding and qualities of the mind. It is difficult to specify the situations which will contribute to the development of qualities of the mind or to the formation of character, because these things are related to the entire process of teaching. Therefore, instead of stating where or when the development is to be sought, only general suggestions can be given in this regard.

Attention :—The power of concentration develops slowly in children; attention is possible only when children find interest in a subject. These two points should be kept in view by the teacher while teaching and assigning work to children. Improvement of memory is to be sought, not in rote-learning, but in clear thinking, and understanding,. By asking a child to describe step by step what he has done or seen or heard in the course of a particular lesson the teacher can find out if the child has remained attentive throughout the lesson or his attention has flagged at any time. If the failure to recollect is due to the flagging of attention, the remedy lies undoubtedly in creating interest in the child for the lesson.

Imagination :—The power of visualising or picturing things mentally can be exercised not merely by literature, history etc. as is supposed by many people but in fact by any material.

In paper work, for instance, the making of the propeller with papercut decorations offers an opportunity for the play of imagination. After the pupils have been shown how to decorate with cut pieces of paper of different colours, each child may be asked to think of his own design for decoration. Similarly through marbling, drawing and painting, arranging exhibitions, collections of leaves and flowers, etc. imagination can be amply exercised.

Reasoning :—Systematic and accurate thinking must be fostered in children. They can be taught to reason, if they are given concrete problems that are simple and within their range of interest.

The execution of a model, marbling, drawing and painting, putting a design in a particular order or space, arranging an exhibition, decorating the school-building etc. are problems of a technical nature and require systematic and accurate thinking. Further, in the course of the project, many problems arise incidentally which offer opportunities to cultivate reasoning. For example, when a pupil referring to the propeller made by one of his classmates makes a statement that the piece of paper out of which the model is made is not square, he may be asked to substantiate his statement.

Observation.—It is generally thought that subjects like Nature Study, Art, etc. are particularly suitable for the purpose of developing the power of observation. But a person can use this power in observing only those things that are within the domain of the subject through which it has been developed; Nature-Study develops the power of observing things of Nature. An artist has the power to observe the forms and colours of things.

A mechanic has skill in observing machines. It is really interest in a particular thing that makes one observe it. To develop the power of observation that may be utilised in a wider field, therefore, the teacher should try to create in his pupils interest in as many diverse things as possible.

There are definite methods of observing things and for these methods again, some knowledge of the specific things and acquaintance with the necessary vocabulary are essential. When the pupils have made a study of the different kinds of paper (exhibits (m)) in respect of colour, size, texture, strength, thickness, weight, and use or suitability for writing, printing, packing etc., it may be assumed that they will have interest in paper and will not fail to observe a paper worth observing. Here the knowledge of determining the colour, size etc. is specific in nature and necessitates acquaintance with a stock of words like red, blue etc. To ascertain colour; foolscap, demy etc. for size; smooth, coarse, medium, ivory finish, porous glazed etc. for texture and so on. It is only this knowledge and interest then that can help one in observing papers of various kinds. Observation not only of paper or other materials or tools etc. in the classroom but of leaves, flowers, grains, clouds, rainbow and other objects of Nature and dress, architecture, utensils and other creations and works of man will help in developing the power of observation of the children, so that whereever they come across objects that are uncommon or worth observing, they will tend to observe them or, in other words, they will acquire a habit of observation and develop a living interest in the subjects and laws of Nature and achievements of mankind.

When a child observes anything properly and finds something new in it, it is only natural that questions like "What is it" or "How does it happen", "What makes it remarkable" etc. arise in his mind. This spirit of questioning or curiosity is natural to all normal children particularly of this age. Curiosity must be encouraged and never repressed. Questions should be invited and an atmosphere favourable for arousing the spirit of questioning, created. One point needs mentioning here. When the teacher demonstrates that the propeller revolves when held over an oven, but stops when held away from it, the children are expected to ask "why does the propeller revolve only over the oven ?" It is only then, however that the answer can be discovered by the students themselves after they have carefully studied things or observed the results of experiments; the teacher should refrain from explaining the why and wherefore in advance.

Formation of Character

It is not possible to give a comprehensive list of virtues that go into the formation of character.

Only a few important traits are discussed below :—

Sense of Duty:—"It includes at least two things : first, an idea of what ought to be done ; and, second, obedience to the idea of doing that thing". If you wish children to develop a sense of duty, put them in situations in which they will feel the satisfaction of doing the right thing.

Children differ widely in skill or performance. Although there is no harm in asking a child to repeat a performance in case of failure, it is unwise to insist on repetition to the point of discouragement. For example, if a child fails repeatedly to mark out the piece of paper (3C andD) for propeller-making, the teacher should help him. Insistence upon developing skill, particularly at this stage is extremely harmful. Appreciate work when you find that an honest effort has been made. The work should be

so graded that the pupils do not get discouraged by failure. For this purpose, make the necessary changes in the syllabus if required. The right selection of work for the child will develop in him a sense of duty and love for work and self-confidence. Patience, perseverance or steadfastness and habit of industry are the natural outcome of a sense of duty.

Forethought :—Every work or activity that is to be undertaken by the pupils should be preceded by detailed planning. It is the general principle to be followed by the teacher. Be it a work of kite-making or arranging an exhibition, there is enough scope for the cultivation of forethought. Disasters and failures in life are mostly due to the want of this quality in man.

Elegant Taste.:—One of the important values of craft teaching is refinement of taste. What good colours and forms consist in can be taught through decoration work, drawing and painting, observation of Nature, study of old and famous works of art and craft and designs of tools, implements, utensils, ornaments, furniture, architecture, dress and other articles of daily use. If the principles justifying the judgement regarding the beauty or ugliness of a thing are explained to the pupils, they will learn how to choose between the good and the bad. Elegant taste can be developed through comments made on the quality of the article arranged in exhibitions. Each child may be asked to review the exhibits and give reasons for his comments.

Desirable Habits:—Cleanliness is one of the most important qualities that must be developed in a child from the every beginning. The classroom, its surroundings, the tools and equipment have to be kept clean and the raw materials stored in a neat and tidy way. In paperwork, the tendency of the pupil is generally to throw pieces of paper away here and there. Wastepaper baskets and dustbins should be provided for collecting litter so that the surroundings are kept clean.

There should be no unnecessary noise in the class. The habits of greeting the teacher, talking politely waiting for one's own turn in doing anything, entering and leaving the class quietly and falling into line etc. should be cultivated in the children by the teacher.

Cooperation:—On every occasion when pupils have to work together e.g. in organising the exhibition, in decorating the school, in projects like visiting farms and villages etc. and even in the classroom when they are engaged in some group activity, the teacher must see to it that each child performs his part as a member of the community, that he is sympathetic towards others and willing to do what is entrusted to him, that he is ready to help others even at his own cost, that he behaves well with his class-fellows and that he shows no anti-social or selfish spirit.

Right Attitude:—It is through craft as well as other activities that a right attitude towards work, fellow-students, teachers and different members of the society can be formed. The pupils should be made to realise that every individual should contribute his share to a common cause and refrain from doing whatever is prejudicial to the group interest. By establishing contact with farmers, weavers and other members of society, the students will be able to develop sympathy, respect and right attitude towards them.

N.B. The teacher should not think that all the qualities and virtues mentioned above can be developed through the making of a single model. The underlying idea behind what has been said in respect of character building is that the teacher should realise the possibilities of craft work in this regard and that he should avail himself of every opportunity that can help achieve the desired object.

A congenial atmosphere is above all the most important pre-requisite for this purpose and to create that atmosphere, not only the teachers but also all the other members of the school community should do their best. Examples of good character are many times more effective than mere precepts.

Cardboard Work :—What has been said about paperwork applies also to cardboard work, woodwork and metal work; the same principles should be kept in view while working out plans of work in these crafts.

Suppose the teacher has to introduce a simple album as a model in cardboard work. To start with, he should show a number of exhibits to the pupils as was suggested in propeller-making. The point of showing exhibits is mainly to create interest in the children.

Exhibit.—The following exhibits may be presented :—

(*a*) Albums of different types e.g.—with single section, in quarter, half and full cloth, double-hinged open back, square back, screw binder, padded cover, expanding leaves etc. and having cover papers decorated by stick printing, lino-cut, spray work, stencil work, paste graining etc.

(b) Albums containing collections of postage stamps, photographs, photographic films, leaves, flowers etc., calico printings, fabrics, feathers, wings of butterflies and other insects specimens of hand-writing, labels of boxes of matches, specimens of lettering, marble and other designs of cover paper, hand-made paper, drawing and painting, lino-cut, newspaper cuttings of articles, portraits of great men and women, illustrations of architecture, sculpture etc., rubbings from coins, engravings etc.

(*c*) Different qualities of bookbinding cloth.

(*d*) Different qualities of marble and cover paper.

(*e*) Illustrations from books of good book-binding work etc. etc.

(1) *B Tools*	(1) *C Equipments*	(1) *D Materials*
Metal or metal-edged scale.	Workboard (wooden)	Flour paste.
Set square	Bowls for water	Cardboard
Dividers	Napkin	Book-binding Cloth
Scissors	Wastepaper basket etc.	Album or pastel paper
Folder		Cord or lace
Saddler's punch		Eyelet etc.
Eyelet punch		
Hammer etc.		

(2) Instructions that can be Imparted Through Exhibits

Exhibit — *Instruction*

(1)A (a) It may be assumed that the pupils of grade III have already learnt how to make an exercise book or a note book. They can therefore profitably study the different types of binding used in album making. The teacher will explain how each type of album is made and what specialities of construction each has. Various types of construction may be illustrated on the blackboard. A knowledge of technical terms like single section, multi-section, open back, square back, quartercloth, stick-printing etc. may be imparted. This will enrich the vocabulary of the students. In this connection a short account of the evolution or history of book-binding may be given.

(1) A (b) The talk on these exhibits should be as brief as possible.

Postage Stamps—Short description of history and geography of different countries. Study of drawings, designs and colours of postage stamps.

Photographs.—Simple account of photography, working of a camera of the simplest type, preferably a pinhole camera that can possibly be constructed by the children themselves.

Photographic Films.—Sensitivity of the film to light, what films are etc. (The object is not to go into details of the science but to give an idea of how a camera works; and what part the film plays).

Leaves, Flowers etc.—Nature-Study and Design.

Calico-printing.—Study of designs and colour combinations (The object is mainly to develop taste, study of places like Masulipatam etc. famous for calico-printing. Its resemblance to stick-printing used in decorative work in bookcraft).

Fabrics:—Evolution of clothing. Famous fabrics like the Kashmere shawl, the brocades of Banaras, the saries of Dacca etc. Recognition of simple weaves like plain, twill etc. Simple study of cloth weaving.

Feather:—Study of Nature, birds and combination of colours in feather.

Wings of Butterfly and other Insects—Simple study of insects and their colours.

Handwriting—Study of the Forms of Letters—the object being mainly to create appreciation and an urge for acquiring the skill of good handwriting. Evolution of writing.

Matchbox and Other Labels.—Simple account of the manufacture of the matchbox and metal sticks, what causes things to burn-more detailed study of the evolution of fire-making than what was studied in connection with propeller-making.

Specimens of Lettering:—Simple study of lettering, specimens of which can be collected from newspapers, journals etc.

Paper:—Study of the paper in greater detail.

Drawing, Painting, Lino-cut:—The collection may be either of the original works of the pupils themselves or of prints of works of famous artists. The main object is to develop artistic taste.

Newspaper Cuttings of Articles.—The cuttings may be on various topics that are of interest to the children e.g., the History of Printing.

Portraits:—Study of the lives of great men and women whose portraits may be collected mostly from newspapers, journals etc.

Illustrations of Architecture, Sculpture etc.:—Evolution of the means of shelter, short account of the famous specimens of architecture sculpture etc. in India. Utensils, ornaments, dresses etc. may likewise be studied.

Rubbings from coins, engraving, etchings, embossed and grained surfaces etc.:—study of history with the help of the collection of rubbings from coins. Interesting studies may also be made on the basis of the rubbings from engravings on metal, stone and other materials, etchings and printing blocks of wood, metal etc., embossed work on leather, repousse work on metal, carving work on stone and wood, grains of leather, woods, and book-binding cloth, paper-cuttings made by pupils, etc.

Paper-cuttings:—The children may be asked to do paper-cutting work in order to collect material on some given topics and it may be neatly preserved in albums and used in studying these topics.

N. B.—Simple books on history, geography, biography, travel, literature, arts etc. may be introduced in connection with these exhibits.

(3) *Practical Operations*:—These may be listed with the help of books on cardboard modelling and book-binding.

(4) *Studies in Connection with Operations*:—Mathematics:—Making an estimate of the quantity of paper needed for making an album or albums, related problems of arithmetic can be introduced and simple multiplication and division taught. Problems like : "If there are 10 pages in an album, how many pages will there be in 25 albums ?" may be set.

Unitary method and reduction in tables of money, weight etc., as expected to be learnt by pupils of Grade III can also be effectively taught through actual problems arising in the course of practical work. Problems such as. "If the price of pastel paper for 10 albums is Rs. 7/- what will be the price of paper for four albums ?" may be presented and the unitary method taught through them. Multiplication tables up to 10 should be learnt by the students for doing such computations.

Construction of equilateral triangles can be taken up in connection with the cutting of book-binding cloth for the four corners and construction of squares and rectangles, may be taught while marking out cardboards .

for covers of the album. Drawing to scale may be introduced in connection with drawing a diagram or a plan of the album.

Mother Tongue—The children at this stage may be given simple books to read on various subjects relating to the materials collected for preservation in the albums. Silent reading may be practised. The students may be asked to describe the practical work done or to be done in detail and in order of sequence.

Knowledge Through Tools and Materials:—Almost all the tools and materials that are required for album-making have been used by the pupils in the execution of the previous models of cardboard work. It may be assumed therefore, that the knowledge that can be imparted through these tools and materials has already been acquired. The only tools that are new in this model are the hammer and the saddler's punch for cutting holes to put the threading cord through the rose-bit to fix eyelets.

The following points are suggested with regard to the three new tools :—

(*a*) Different types of hole-cutting punches e.g. saddler's punch of the simplest type, railway ticket-checker's punch, tramway conductor's punch, office punch, punch pliers with single nipple, six-hole revolving punch pliers etc. (If possible these different punches should be shown and demonstrations given with them).

(*b*) Proper care in the use of the saddler's punch holding it vertically in the left hand, proper positions of the different fingers of the hand; placing the leaves to be punched on the workboard so that the desk or bench is not damaged by punch cuts, and using a piece of thick cardboard between the leaves and the workboard so that the cutting edge of the punch is not spoilt; cleaning the hole of the punch from time to time to facilitate clean cutting, avoiding the use of the punch in cutting materials which are hard like metal, stone etc.

(*c*) Names of the different parts of the hammer—the head and the handle, the face, eye etc.

(*d*) Simple Study of Hammer:—Different shapes and sizes of hammer used in various crafts and industries—the smallest being used in goldsmithy or watch -repairing and the biggest in blacksmithy or ironwork. Hammers of different materials—lead hammer, hide-headed hammer etc. Hammer and Mallet. The requirements of a good hammer—the handle must be fitted tightly into the eye etc.

(*e*) Proper Use of Hammer—At the time of striking, the arm should pivot at the shoulder, elbow and wrist; the hammer is to be held in the right hand at a particular distance from the end of the handle, the force varies with the variation of the position of grip etc.

(*f*) Use and Care of Rose-bit:—Using the rose-bit in making V-shaped cuts in metal, wood etc. to set nails, screws, bolts etc., fitting the rose-bit in a brace; using the bit for splitting eyelets etc.

(*g*) Evolution of tools and implements.

(*h*) In case of any injury resulting from the wrong use of hammer, instructions may be given about the simple first, aids.

N. B.—While the children particularly of this age cannot possibly be expected to handle these tools like an expert cardboard modeler, the teacher should nevertheless try to demand gradually more and more coordination of hand and eye and proper use and care of tools. This essentially helps the pupils not only in acquiring skill or improving efficiency in execution but also in developing appreciation of workmanship. The more a child knows his tools and materials he works with, the more will he be able to find joy in work and to express himself better through his creation.

(5) Arts, Crafts, Projects and Activities.

(*a*) Stick-printing.
(*b*) Linocut.
(*c*) Lettering.
(*d*) Spraywork.
(*e*) Stencilling.
(*f*) Pastegraining.
(*g*) Cord-making.
(*h*) Photography.
(*i*) Papermaking.
(*j*) Papercutting (If already done, more advanced work may be undertaken).
(*k*) Visiting gardens for collection of wings of butterflies and insects.
(*l*) Visiting a weaver at work.
(*m*) Collections as suggested in the list (1) A (b)
(*n* Exhibition of collections etc. etc.

(6) Attitudes, Understanding etc.

These may be developed as previously in connection with paperwork.

List of some books in paperwork, cardboard work and bookcraft :

(*a*) Paper Toy Making, by Campbell.
(2) Paperwork, by A. N. Sen.
(3) Instructive and Ornamental Paperwork, by L. Walker.
(4) Paper folding and Cutting for Seniors, by W. S. Bartlett, H. Weinwright and W. G. Glack
(5) Paper Occupations for Infants, by C. G. Ritchie and M. D. Winter.
(6) Cardboard Modelling Vols. 1 and II, by L. Dixon and B. R. Browning.
(7) Bookcrafts and Book-binding, by J. Mason.

Woodwork

Let us suppose that the "Execution of articles" (useful articles which must be saleable in the market), which is the first item of the syllabus in woodwork for Grade VI is to be introduced in the class. The teacher and the students should first prepare a list of such sealable articles, keeping the demand of the local market in view. The teacher should also see, while the list is being compiled, that the students are capable of making the articles. If the whole work of making an article is conducted as a project or a series of projects, the students will be immensely interested in the work. In order to illustrate how this work should be done, we will consider the making of a single article out of the list. Let us suppose that a low stool is to be made of country teak with mortice and tenon joint.

(1) Exhibits, Tools, Materials etc.

A. *Exhibits :*

(*a*) Stools or their models with tops that are rectangular, square, oval, round etc.

(*b*) Stools or their models with turned legs.

(*e*) Stools or their models having upholstered tops.

(*d*) Stools or their models having cane, braid or ropewoven tops.

(*e*) *Charpoi* or its model.

(*f*) Folding type stool or its model.

(*g*) Pictures (if available) of stools of ancient times of different countries.

(*h*) Charts or blue-prints of drawings or designs of stools not covered by any of the above items.

(*i*) Charts showing different kinds of mortice and tenon joints.

(*j*) Samples of woodwork decorated in different techniques like inlay, carving, matting, overlay, fretwork, pokerwork, graining, moulding etc.

B. Tools.

Pencil

Folding scale
Handsaw
Tenon saw
Light backsaw
Plane

Bevel gauge
Try Square
Marking awl
Marking gauge
Sanding block
Firmer chisel, bevel edged
Firmer chisel

C. Materials.

Timber, country teak

Glue
Glass paper
French Polish
Screw
Cotton and Cloth for polishing etc.

D. Equipment and teaching aids.

Water in come container.
Glue kettle
Stove or Oven
Graph Board
Blue prints.
Catalogue of tools, materials etc.

Mallet
Bastard file
Scraper
Cramp
Screw driver
Drill or Brace and bits
Sharpening stone
Bench hook
Shooting board etc.

Note :—It may be pointed out that the supply of too many tools hampers the growth of resourcefulness of the students. The correct posture and proper use of tools must be insisted upon, because, one of the most important objectives of craft educaton is sound workmanship, and as bad tools and defective materials hinder the development of good skill, it is necessary to provide good and adequate tools and materials. Efficiency should not suffer in any way. Instead of squatting on the floor and holding a piece of wood between two legs used as a cramp, work-benches of the simplest type or at least *trestles* should be provided and these can be made by the advanced students at very little cost.

(2) *Instructions Through Exhibits* :—(1) a—How to draw an ellipse of given dimensions. Study of different shapes that can possibly be given to tops of stools.

(1) b—Simple account of turning. Articles that are generally made by this process. Places famous for turned and lacquered wooden articles.

(1) c—Simple account of upholstering and materials used for it.

(1) d—How can weaving with cane, braid, rope, leather strap or such materials be suitably introduced in furniture making.

(1) e—*The charpoi* is only one of the many typical examples of Indian furniture, short study of such pieces of furniture and woodwork.

(1) f—Short study of folding furniture and its possibilities and limitations.

(1) g—Simple account of the evolution of furniture design and decorations, and what a good design of woodwork means.

(1) i—The most widely used joints in carpentry. The different M & T joints e.g.—Common and through M. & T, Haundhed M & T., Barefaced M &T etc., Why the name Mortice and Tenon, its relation with Mortice Chisel and Tenon Saw.

(1) j—Short account of the different techniques.

Operations : These may be listed with the help of some books on woodwork.

(4) *Instructions Through Operations.*—One thing should be made clear that method and forethought which are two very essential qualities can

best be developed through operations. Special attention should be paid to the student's plan and the way he works. For the making of the stool, the following steps may be followed—1. Designing, 2. Preparing the cutting list, 3. Sizing of all pieces, 4. Marking or setting out, 5. Cutting (Here mainly mortising and tenoning), 6. Trial assembly, 7. Final assembly and 8. Finishing.

Application of forethought is required particularly in designing, which requires considering the following points :—

(*a*) Utility or the use or purpose which the article would serve, (*b*) Size or the measurements of the different parts of the article. These shall again be determined by a good sense of proportion and cost of timber, (*c*) Timber to be used. This should be selected in conformity with the use of the article, e.g. whether it should be light and portable or it should be durable or it is to match other pieces of furniture etc. Joints that are necessary for the structure are also parts of the design and finally it is to be determined whether there should be any decoration, if so in what technique inlay, carving, lacquering etc.

Instead of executing a stool from a design given by the teacher, the pupils should be encouraged to prepare their own working designs. The teacher may give some specifications, say, with regard to the height of the stool, the shape of the top, the size of the cross-section of the legs etc. Giving such specifications will help the student to learn to work according to given set of conditions and this also makes for convenience in the supply of timber. Although the task of the teacher becomes easy if he gives the same design to be executed by all the students, it robs them of the joy of producing something which is their own creation.

The working drawings may be preceded by rough sketches. Each pupil should be asked to attempt as many designs as he can and helped in selecting the best one. The use of graph paper will be helpful for scale drawing; the students should be able to read plan, elevation and picture-view drawings.

The cutting list is to be prepared from the working drawing. Names of the different parts of the article to be constructed, the number of each part and its dimensions i.e., length, breadth and thickness should be mentioned in the list.

For example, for a stool, a cutting list may be as follows :—

(A) Legs—4 pcs.—15″ × 2″ × 2″

(B) Top side rails—2 pcs—7″ × 3″ × 1″

(C) Top end rails—2pcs.—6″ × 3″ × 1″

(D) Bottom cross rails—2 Pcs.—9″ × 1½″ × 1″

(E) Central cross rails— 1 Pc—14″ × 10″ × 1″

(F) Top cross rails— 1 Pcs.—14″ × 10′ × ¾″

The next operation is sizing of the different parts. Assuming that the work is plain, the tools necessary for sizing are : plane, marking gauze, try square, handsaw, foot-rule, marking awl, bench hook and shooting board.

For the marking out which is the fourth step, the tools needed are: footrule, marking gauze, try square, marking awl and bevel gauge (if the legs are inclined and not vertical). The portions of the pieces that are to be cut out may be marked.

For the fifth step which is cutting and in this particular case mortice and tenoning, the necessary tools are; mortice chisel, tenon saw mallet and firmer chisel.

Now for trial assembly the following tools are necessary: firmer chisel, bevel chisel, mallet, tenon saw, bevel guage, try square, footrule, marking awl and light back-saw.

For the final assembly, hand drill, cramp mallet, saw and screw—driver will be necessary and the materials namely glue, wooden pin and screw will be required.

As to the finishing operation, if it is to be performed, this should be French polishing, for which tools needed are plane, saw, rasp, bastard file, sanding block and scraper, and the materials required are sand paper, putty and French polish.

The above list of tools and materials corresponding to the different steps of operation, should be prepared in advance by the teacher or preferably by the pupils themselves.

Instructions Through tools, Materials

Saw—Different kinds of saw, number of teeth per inch, angle of the teeth, setting the teeth, sharpening, how to know the temper of tools, how to handle each type of saw. Care of saw.

Plane—Different kinds of plane, names of the different parts of the plane, how to sharpen the cutter, the angle of the cutter, care and use of the plane.

Bevel gauge—the different uses that it can be put to.

Try square—its use, how to know if the blade is exactly at right angles to the stock.

Chisels—Different types of chisel and their uses, sharpening, care of chisels. (Students should be taught to use the mallet and not hammer with chisels.)

Sanding block—Why should a sanding block be used?

Scraper—How to use and sharpen it? Care of scraper.

Files—Different kinds of files, their uses and care.

Cramp—Different types of cramp or holding devices.

Drill—Different types of drill, care of drill and its bits.

Sharpening stone—Different types of stone and tools for sharpening, their care and use.

Note: Tools like marking awl, marking gauge, sanding block, mallet,

bench hook and shooting board can be prepared by the pupils themselves. This can be done as a project. Pupils should be taught to distinguish between good and bad tools. They should know which manufacturers of tools are dependable.

Materials

Timber—The timber used being country teak, its simple botanical study may be made. Geographical distribution of teak in India, different uses of teak, transportation of teak from different regions, the need for afforestation, Burma teak, seasoning of teak and other timbers, storing of timber, commercial study of teak and other important timbers, soft and hard wood, insecticides used for the preservation of wood, standard or trade sizes of timber and their market prices etc.

Glue—What is glue and how is it made ? Some of the topics that can be discussed that it is made from horn, hoof etc ? Casein and other adhesives used in woodwork. Preparation of these adhesives and their use.

Sandpaper—How is it made ? Its different grades, care and use.

French Polish—Different kinds of polish used in woodwork. Their preparation and use.

Screw—Different grades and shapes of screw, nail, bolt, hinges and such other materials used in woodwork. These can be studied from illustrated catalogues.

(5) *Arts, Crafts, Projects or Activities*

(*a*) Collecting different specimens of timber.

(*b*) Collecting different cabinet hardware materials, like cuphook, eye hook, lid support, drawer pulls and knobs, catches, looks, hinges etc. or preparing the charts of these with illustrations.

(*c*) Preparing charts of tools with names of their parts and instructions for their use etc.

(*d*) Visiting different places to study and sketch furniture designs and other woodwork.

(*e*) Visiting carpenters at work to study their tool, methods of work and technical terms used by them.

(*f*) Preparing charts entitled "Don'ts with Tools" giving a list of what should not be done with different tools like saw, chisels, plane etc., e.g.,—dont, keep a plane with its cutter at the bottom but resting on its side, otherwise the sharpness of the cutter may be damaged, don't cut or damage the work-bench in any way ; don't use a hammer on chisel etc.

(*g*) Practising different techniques of decoration like inlay, carving, fretwork etc.

(*h*) Making woodwork tools like marking gauze, mallet, bench hook, shooting board etc.

(*i*) Arranging an exhibition of the models and of the collections made by pupils.

(*j*) Selling the finished articles in the market.

(*k*) Spending the money earned as profit from the sale of articles for some community purpose like better tools, picnic, contribution to poor fund etc.

(6) *Qualities to be Developed.* (This may be treated as stated under (6) in paperwork).

It is this age (about 12 years) that is particularly suitable for the development of qualities of individual responsibility, group leadership etc., for, it is now that children begin to be less and less individualistic and take interest and initiative in cooperative activities. The teacher should, therefore, use this opportunity now and so plan his work that these qualities may be developed. For this, the teacher can assign various kinds of duties and responsibilities to the pupils. Issue and check the tools, get them replaced when damaged, take proper care of them, maintain a tools' register, issue and store raw materials, maintain a stock register of materials, take proper care of equipments, furniture and fixtures, books, instruction sheets, maps and other teaching aids, look after general cleanliness and sanitation, take proper care and display of finished articles and maintain their stock register, ledger etc.

General Suggestions :—Various methods of storing and issuing wood-work tools are in vogue in different workshops. Below is suggested a method which works very satisfactorily. Tools should be kept in a tool cabinet, a plain almirah with shelves. Each kind of tool should have a place of its own and there should be separate hooks, cleats, clips, grooves, brackets etc. for holding or keeping individual tools. For the convenience of easy checking which may be done almost at a glance, there should be as many such places as there are tools so that any vacant place may be detected at once. Besides the shelves, the leaves of the doors and wall spaces of the cabinet may be utilised for the storage of tools. In the cabinet itself a list of tools in stock can be hung up for reference. It will be an added advantage, if the inside of the cabinet is lined with paper and on it bold line-drawings of tools in their original sizes are made where they are stored.

As for the issue of tools the following simple method may be introduced. Take one or two pieces of wood each about 2″ x 3″ x 2″ in size. One the 3″ side of each, about $2\frac{1}{2}$″ long wire nails with the heads cut off are fixed in a line and each to a depth of about $\frac{3}{4}$″ and at a distance of about $1\frac{1}{4}$″ from one another. Short names of the different tools like saw, chisel, plane etc. are written on the wooden base against the nails. Needless to say only one name is written against each nail. Each pupil will have six or eight tickets (the number of tickets depending on the maximum number of tools, to be issued at a time to each pupil) made from cardboard or leather and bearing the pupils' signature. Those tickets should have punch holes big enough to allow the nail to pass through. A manager from among the pupils is appointed to look after the tools. When for example a student wants a plane, a saw and two chisels, he hands over four of his tickets to the manager, who, on issuing the tools, puts one ticket against plane, another against saw, and the remaining two against chisel with the corresponding nails passing through the punch holes. At

the end of the craft period, the borrower on returning the tools takes back his own tickets from the manager, who again on receiving the tools back, keeps them in their proper places. There is no need to maintain any issue book or do any clerical work for the issuing business.

List of Some Helpful Books on Woodwork

(1) The Modern School Woodwork—Parts I to VI by G. F. Johnson. Publishers—Blackie & Sons Ltd.

(2) Woodwork—by W. J. Wood. Publishers—the English Universities Press Ltd.,

(3) Woodworking for Everybody—by Shea & Wenger. Publishers—International Textbook Co.

(4) The A B C of Woodwork—by Charles W. Heyward. Publishers—Evans Bros. Ltd.

(6) New Woodwork from Old. Publishers—Evans Bros. Ltd.

(6) Hammer and Nails Carpentry.

(7) Constructive Woodwork For Schools—by A. Gregory. Publishers—The Dryad Press.

List of Woodwork Tools for a Class of 20 Pupils.

Serial No.	Name of Tools	Description	Quantity required.
1.	Handsaw	20"	2
2.	Do.	18"	2
3.	Tenon Saw	12"	5
4.	Bow Saw	10"	2
5.	Pad Saw	..	1
6.	Dovetail Saw	8"	1
7.	Jack Plane wooden	8"	1
8.	Iron Plane Stanley	9"	4
*9.	Smooting Plane Wooden	8"	4
*10.	Rabate Plane	1" cutter	2
*11.	Plough Plane	With a set of cutters.	1
12.	Spoke shave	Flat	2
13.	Do.	Round	2
14.	Firmer Chisel	1"	4
15.	Do.	$\frac{3}{4}$"	10
16.	Do.	$\frac{1}{2}$" (10 bevelled, 10 Plain).	20
17.	Do.	$\frac{1}{4}$	4
18.	Mortice Chisel	$\frac{1}{4}$, $\frac{3}{8}$	4 each
19.	Gauges	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$	1 each
*20.	Mallet	..	20
*21.	Marking gauge	..	10
22.	Folding Scale	..	20
23.	Try-Square	6"	20
24.	Do.	8",12"	1 each
25.	Bevel gauge	7½"	2
26.	Wing Compass	6"	2
*27.	Marking Knife or Awl		20
28.	Hand Screw	10"	2

S. No.	*Names of Tools.*	*Description.*	*Quantity required.*
29.	Saw set		1
30.	Pincers	6″	1
31.	Pliers	6″	1
32.	Hammers, Warrington	1 lb. ½lb.	2 each
33.	Brace	8″ sweep	2
34.	Hand Drill		1
35.	Drill and Brace	Different sizes	1 each
36.	Fret saw Frame		1
37.	Callipers	Inside and Outside	1 each
38.	Cramp	4″	1
39.	Oil Stone		2
40.	Oil Stone for gauges	Different sizes	2
41.	Oil can		1
42.	Scraper	6″	1
43.	Screw driver	4″ 6″	2 each
44.	Rose-bit	Medium	1
45.	G Clamp	4″	1 pair
46.	Bastard file	10″	3
47.	Half round file	8″	1
48.	Triangular file	3″, 4″, 6″	1 each
*49.	Shooting Board		3
*50.	Bench Hook		20
51.	Glue Kettle		1

Metal Work

Suppose the construction of the "Box" as mentioned in the syllabus in metalwork for Grade VII is to be introduced in this class by the teacher. Let the shape of the box be rectangular and the metal to be used be copper. The teacher should prepare his teaching plan as suggested in other subjects.

Exhibits, Tools, Materials, Equipments etc.
A. Exhibits—

(a) Boxes made of different metals like copper, brass, black-sheet etc.

(b) Boxes made in different styles of joining, e.g. by riveting, soldering etc.

(c) Boxes or other articles of metal decorated by different techniques like etching, engraving, repousse, inlay, applique or overlay etc.

(d) Illustration of boxes of different shapes and sizes that the pupils can possibly do.

(e) Boxes made of materials other than metal, e.g. cardboard, wood, ivory, plastic, stone, clay, porcelain etc.

(f) Charts showing designs of boxes—the object is to give suggestions of different possible shapes etc. of boxes, besides creating interest in box-making.

* Advanced students can make the wooden part of these tools themselves.

(g) Charts giving names of metal boxes for different uses e.g.—cigarette box, colour box, powder box, playing-card case, snuff box, jewellery box etc.

(h) Illustrations (from books) of historical specimens of boxes, caskets etc.

(i) Specimens of different metals and alloys other than those used in (a).

B. Tools.

(a) Pencil . . .

(b) Set square. . .

(c) Try square . .

(d) Metal shears . .

(e) Scissors and other tools necessary for cardboard work.

(f) Ball Peam hammer

(g) Planishing hammer .

(h) Raising hammer .

(i) Mallet . . .

(j) Scriber . . .

(k) Metal scale . .

(l) Wing compass . .

(m) Blocks of wood for bending metal sheets

(n) Cold Chisels

(o) Files of different shapes & sizes.

(p) Scrubbing brush

(q) Chamois leather

(r) Surface plate

(s) Draw plate

(t) Draw tongs

(u) Pliers

(v) Soldering outfits

(w) Clamps and clips

C. Materials, equipments etc.

(a) Copper of different gauges

(b) Carboard and other materials necessary for carboard work.

(c) Emerycloth

(d) Steal Wool

(e) Iron wire

(f) Solder, hard and soft.

(g) Killed acid or zinc and hydrochloric acid (dilute)

(h) Borax

(i) Sulphuric acid solution for pickling

(j) Metals other than copper (if combination of metals is used).

(k) Wire for the pins of hinges

(l) Chemical for oxidising

(m) Charts showing diagrams of tools and their different functional parts with instructions for the use of tools, etc.

(x) Jeweller's saw
(y) Hearth and bellows
(z) Oxidising outfits etc.

2. Instructions Through Exhibits

Ref. of Exhibits.	*Instruction*
(1) A.a.	Short study of metals and particularly of copper—the object is among other things to draw the attention of the students to the special appeal and properties of each metal and to the fact that for specific purposes, one metal is preferable to others.
(1) A.b.	Different methods of constructing boxes.
(1) A.c.	Short account of the different techniques of decoration.
(1) A.d.	The value of the shape and size in the construction of things, showing the good features of the designs and explaining why they are good.
(1) A.e.	Study of the possibilities of the different materials, of their constructional methods, the limitations of each material etc.
(1) A.f.	What particular things should be kept in mind when making designs of boxes. The most important of them being simplicity of form and proportion, the former helping in the execution and the latter contributing to beauty.
(1) A.g.	The point of displaying such a chart is to arouse the imagination of the pupils and to create interest in box-making. the pupils will think of the different uses to which metal boxes may be put.
(1) A.h.	Short study of the relevant history and geography, specimens of metalwork found in the excavation of Mohenjodaro, the Iron pillar of Delhi etc.
(1) A.i.	Short account of the different metals and alloys not covered by (1) A.a— study of aluminium, German silver, gold (guinea, carat, pure), tin, cast and wrought iron, steel, stainless steel, nickel, pewter, silver, lead, zinc etc. Study of stone age, copper age etc.

(3) *Operations or Technical Processes Involved*: This list can be prepared with the help of books on metalwork. It is necessary to mention that actually, demonstration on the making of a complete box will not be required because, some of the operations will already be familiar to the students, for these should have been learnt by them while executing the previous models. The teacher will therefore, demonstrate techniques that are unknown to them. Further, it does not mean that he will demonstrate one after another all the techniques unknown to the pupils. Rather he should split up the whole work into several units. For example, scoring the lines

where corners of the box will be formed, binding the frame or the walls of the box with its bottom with annealed iron wire, hard and soft soldering, preparing the hinges etc. are the different units whose techniques are to be demonstrated. The teacher can treat each unit separately. For some units he may use instruction sheets conveniently. Pupils taught to use instruction sheets will be able to follow the technical language of books as well as to keep record of what they do in practical classes and see in demonstrations.

(4) *Instructions Through Operations*

(a) What happens as a result of annealing ? Why is annealing necessary ? Why does a metal become darker on annealing ?

(b) How is planishing done, precautions to be taken in planishing.

(c) Procedure adopted in scrubbing and cleaning the metal—use of emery paper, pumice powder and cloth, indigenous method of scrubbing and cleaning.

(d) Why are the edges of the sides at the four corners filed to form a bevel of 45° angle ?

(e) Why is scoring done to cut V-shaped grooves along the lines where the metal is to be bent at right angles ? This process should be compared with the corresponding one for bending due in cardboard work.

(f) Precautions to be taken in bending and the matter of bending. Use of different kinds of blocks for bending.

(g) Why is annealed iron wire used in binding ? Care to be taken in binding and method to be followed.

(h) Why is borax used in soldering ?

(i) Precautions to be taken in heating for the fusion of the solder and reasons thereof.

(j) Difference between hard and soft soldering.

(k) Why does the shape of the box become distorted after soldering ?

(l) What should be the width of a strip of metal to make it into a tube of a particular diameter ? The ratio between the diameter and circumference of a circle.

(m) The use of odd number of joints in hinges.

(n) The chemistry of oxidising.

(o) Precautions taken in polishing.

(p) Atmospheric action on metals and how to prevent it ?

Instructions Through Tools, Materials etc.

(a) How to know gauge grades of metal sheets, wires etc ? Characteristics of metals and their alloys—specific gravity, conductivity, tenacity, ductility, fusibility, solidification, contraction and expansion, hardness etc. Metal industries in India. Geographical distribution of metals and ores.

(b) Emery cloth, emery paper and sand paper. Methods of manufacture and uses.

(c) Different kinds of solder, their uses, composition and preparation.

(d) What is killed acid, how is it made ? The chemistry relating to it .

(e) Borax, its properties and uses.

(f) Sulphuric acid, its properties, proportions used in making pickle, precautions to be taken in the use of the acid. Chemistry of the use of pickle.

(g) Study of the chemicals used in oxidising.

(h) Hammers, their uses and varieties.

(i) Use and care of cold chisel, tempering etc.

(5) *Arts and Crafts, Projects or Activities etc.*

(a) Visiting a blacksmith, goldsmith, tinsmith, brass and bellmetal worker etc.

(b) Lead and aluminium casting.

(c) Repairing and preparing small tools.

(d) Etching, engraving, repousse, inlaying etc.

(e) Visiting hardware, metal work shops etc.

(f) Arranging an exhibition of metal work specimens collected from the local area.

List of some helpful books on metalwork.

1. Woodwork and Metalwork, by C.A. Goodgur, Pub. The Dryad Press.
2. The Home Workshop, Pub. Odhams Press Ltd.
3. Art Metal Work, by Emil F. Kronquiet, Pub. Whittlesay House .
4. Handcraft in Wood and Metal, by Hooper & Shirley, Pub, B.T. Batsford Ltd.
5. The Principles of Educational Craftwork in Wood and Metal, by A.E. Leeson, Pub. Pitman & Sons.

CHAPTER 1 (d)

FISHERIES

The use of teaching aids like models, museum specimens, charts, drawings and simple demonstrations is helpful in imparting instruction about fisheries. Fishing is a skilled occupation involving strenuous manual labour, and the scope of learning it by practice is very limited for small children. Throughout the course, the teacher has to take his pupils to places where they can observe fishing operations and fish handling to gain first-hand information on the subject.

In Grade 1, when the course of instruction is just initiated, the duty of the teacher is to see that the pupil's power of observation is properly developed. Instead of merely confining the children to the classroom and engaging them in conversation, eliciting information from them and supplementing it by his own observations, the teacher should take them out of the school to aquatic environs in the neighbourhood and allow them observe animate and inanimate objects around them. The teacher can later on help them in the class to recall what they have seen.

In Grades II and III, simple experiments, examination of external features of the fish and demonstrational dissections as detailed in the syllabus, have to be carried out. A small table aquarium will be of great use in the class room in explaining not only the adaptional features of the fish to suit the aquatic environment, but also its life habits regarding its movements, feeding and breathing. Museum specimens and charts will serve as useful aids in teaching the distinctive features of the principal varieties of fish available in the locality.

In Grade IV, the students have to be taken out more frequently than before on excursions to fish places so that they might watch the indigenous craft and tackle actually being used in catching fish. With the help of models of crafts and nets the teacher can give details of construction and the comparative efficiency of their operations. Children would like to make toy boats and they must be encouraged to build miniature models of the craft in use in the locality. A visit to the place where the indigenous craft is built and repaired will prove very useful at this stage.

In Grade V, besides giving a comprehensive view of the fishes, an attempt should be made to acquaint the pupils with the shell fish that are commonly used as food. The possibilities of culture of fish and shell fish may be indicated, and later on elaborated in Grade VI to VIII. The function of the larvicidal fishes is best taught by keeping such fish as *Panchax*, *Haplochilis Barbus* in aquaria. Introducing the mosquito larva into the same aquarium, the pupils may be asked to observe the acridity with which these fish feed on larvae. Emphasis must be placed on the need for destruction of the larvae. As regards fish culture, the teacher should clearly bring out the idea that water can be cultivated to yield fish in the same manner as land is cultivated for growing crops.

In Grade VI, the knowledge to be imparted in regard to ships, boats, compass, waterway rules and signals is bound to be somewhat technical. The resourceful teacher has to reduce the subject matter to the bare fundamentals. The nets and their making can be studied by the pupils suggested in connection with the study of the indigenous craft. Preservation of nets by barking may be actually shown to the pupils when this is done by the local fishermen. The oceans of the world and the nature of the coastline of this country may be treated as correlated topics.

In Grade VII, for explaining fluctuations in weather conditions, the teacher may, whenever possible, plan an excursion to the nearest weather forecasting station and acquaint the pupils with the various instruments in use. He should explain the effect of the moon on the tides, and fluctuations in the quantity of fish catches in relation to the phases of the moon. He should explain that fluctuations in the quantity of fish-catches in different seasons and at different times in the same season are related to the habits of the fish, such as breeding and feeding, that in turn, are directly or indirectly dependent on environmental conditions like, temperature, saltiness of the water, and tides under the influence of the inshore waters or of the pond or tank in the vicinity.

In regard to the preservation of fish, the local methods should be fully demonstrated to the pupils. Emphasis should be placed on improvements in the existing procedure. The teacher should stress the need to cure the fish soon after capture without allowing the bacterial *spoilage* to set in, and to observe strictly hygienic conditions in the process employed. The local methods of curing may be tried by the pupils with advantage under the supervision of the teacher and this procedure always ensures a substantial income to meet certain small items of expenditure for the maintenance of the school.

In teaching the life history and the general classification of animals and plants, the teacher should present the picture of various forms of life as mutually inter-dependent and deriving their essential requirements from the surroundings. He should demonstrate the presence of microscopic plant life, and its importance to the very existence of all aquatic life. By arrangement with a High school or College in the neighbourhood, he should show the students microscopic forms of life.

Lessons in fishery products and industries may be introduced with samples of materials kept in the museum and photographs.

In Grade VIII, the instruction should be of an advanced nature. Advantages of mechanised craft may be brought out. Nets in use in waters of countries abroad and navigational methods can be illustrated by charts, lantern slides and educational films wherever possible. The great fishery centres of the world can be treated as a correlated topic of geography. General principles involved in the working of the thermometer, the barometer and the telescope may be taught. Lessons on variations in atmospheric pressure should lead to the study of breezes, monsoons and cyclones. For the treatment of methods of fish culture such as bearing of fry and stocking of the ponds, the pupils should be taken to suitable local centres in consultation with State Fishery Departments.

General Directions

(1) Emphasis should throughout be laid on rousing the curiosity of the pupils and giving them material to satisfy it. The teacher should guard against stuffing the minds of pupils with too much factual information. (2) The school should, if possible, maintain a small fish pond where elementary principles of fish culture can be demonstrated. (3) It is presumed that small inexpensive instruments like a rain-gauge, maximum and minimum thermometers etc. will be kept in the school. (4) In schools situated in coastal districts, practical demonstration units for fish curing can be maintained with the help of the State Fishery Department. (5) The teacher should place emphasis on the fact that the fishing industry depends at present on many factors which cannot strictly be controlled. The idea should be developed that the main problem is to find out means whereby hazardous nature of the occupation can be eliminated by bringing about improvements in the various sectors. (6) The teacher should likewise emphasise the need for cooperative effort in operations utilisation and trade and in the major problem of finance. (7) While developing the idea that fish is something that can be harvested as a natural resource, some principles of conservation should also be brought home to the pupils.

CHAPTER I (c)

HOME CRAFT

The Ideals of Home Science Education

The Home and School

Most people now recognise the importance of Home Science, and how necessary it is for the home and school to work together. The value of parents home life cannot be over-estimated. Parents in India can, however, seldom supply all that a child needs. This is where the school can fill the gap. The teacher should give the children an opportunity to *achieve right standards in thought and action. One of the essential factors is an understanding of the fundamental principles of healthy living, and the application of the same in the home and in the school, so as to make every boy and girl into a good home-maker.* Emphasis must, however, be placed upon *positive health* throughout rather than upon disease and also upon social conditions influencing health. *The school may demand more than the home in regard to punctuality, cleanliness, care of property, honesty, manners, cheerfulness and sensibility.*

Coordination of the Home and School.

The teacher concerned in domestic crafts can specially *help the home by setting good standards.* The pupils can be sent to homes, where they can help in the art of home-making, and thereby get their practical training and do social service as well.

In the present circumstances and more so in community centres, the school must play a part in the life of the community.

Minimum Standards in the community.

The child should *learn to live as a member of the community,* sharing in its activities and learning to accept responsibilities.

Organisation of Teaching

The syllabus in Home Science has two distinct parts. The first part relates to Junior Grades I to III and the second part to Senior Grades IV to VIII.

In the Junior Grades, Home Science does not have the status of a main craft. The teacher should promote the child's interest in the subject.

The teacher should aim at the following :—

(1) Ensuring hygienic conditons, (2) Promoting hygienic habits, a healthy way of living and interest in personal appearance, (3) Promoting habits of care and proper use of equipment, (4) Securing the application of hygienic principles.

Many teachers and parents are apt to expect from children what they cannot possibly achieve and do not provide them with adequate opportunities to achieve what they can. In order to avoid disappointment and give suitable guidance it will be helpful to bear in mind some of the general results of recent psychological investigations in respect of children's physical and mental development between the ages of seven and 11. ,

Salient Features of Development of Children Between the Ages of 7 and 11.	General Course of Action to be Taken by the Teacher of Home Science
Physical Development: This can be called the "filling out" period with a characteristic mark of steady growth. (Followed by "springing up" period between the ages of 12 and 16—the period of rapid growth of the organism). In healthy children, there should be a steady increase of about 4½ lbs. per year up till the age of 11.	In order to maintain good health and efficiency, the teacher of Home Science, in conjunction with the school medical officer, should see that the child has the proper amount of food, specially growth-promoting food, and thus avoid lowering resistance to disease. Thus he can do much to guarantee to each child that measure of growth and physical efficiency that is the norm for his particular type.
During this period, the children are peculiarly susceptible to certain diseases like measles, chicken-pox, diphtheria etc.—illnesses which arrest the growth of the body, particularly the bones.	The teacher should be careful to see that the child is not made to work hard before he has completely recovered from illness. If the child has fallen a prey to the above disease, particular attention should be given by the teacher not to urge young children to do hard work—(practical work) before they have completely recovered from illness ; as this will have an injurious effect on the bones.
Mental Development	
(a) The sense of perception or the sensory capacity of the child at this age is rather acute. (b) The limit of a child's comprehension is very narrow.	The matter presented to the child must be limited to small brief simple facts. If a child is to grasp a group of ideas as forming a single whole and to understand it as conveying a systematic meaning the number of such ideas must be very small and the scheme with which they are combined must be very simple.
Suggestibility and Imitation: A noticeable feature in the period between 6 and 11 is the child's extreme susceptibility to suggestions.	Suggestibility implies ready confidence that children have in their parents and teachers. The children at this age imitate their parents and teachers, and the proper behaviour on the parts of the elders should constantly be called forth. However, the teacher should develop the critical sense of the child. The child is willing to accept facts and views on

trust. The subjects in Home Science in particular should not be isolated and labelled in separate compartments of the time table, but should be treated in close relation to the child's concrete experience.

Aesthetic Development : Symbolic drawings in the early stages followed by more realistic ones. The capacity of genuine aesthetic appreciation of the child at this age is hardly developed. Their nascent sense of beauty consists in little more than the pleasure of the thrills, simple sensation and perception, bright colours, rich sound and well marked rhythm. They tend to draw by means of *symbols* and the greater details are left out, but by the age of 9 or 10 children's drawings become more realistic. But while the child gains in technique, he loses the feeling for rhythm and design, which is the basis of all his art. (Examples can be easily found in the children's drawings, in Shankar's Children's Annuals).

At this stage, it is necessary to impress upon the child the various features of life through dance, music, drama and play.

Interests Revealed by Play : The child during this age is interested in activities which spring largely from the interest in making things and the emotional zest accompanying his manual activities. These activities do not display any delicate skill.

Since children at this age are like little workmen looking out for jobs, the teacher should give them occupations which will rouse their curiosity, satisfy their sense of constructiveness, love of acquisition and self-assertion. They must also be given the satisfaction that they are makers and creators of something which they can call their own. Children should be taught to bring to bear on the work their constructive imagination, which has been cultivated in the world of make-belief. A child's pleasure in imagination and judicial discipline should provide an inexhaustible reservoir of educational motive. This could be done through stories, games, projects and playlets on "make-believe", etc. Birthday parties playing the part of father and mother at meals (showing children how to serve etc), stories of festivals like Diwali and Dussehra put into action.

Housewifery : Grade I

Topics	*Method*	*Theory-points to be Emphasised*	*Points for Promoting Further Interest*
Dusting of Classroom Furniture.	The teacher should demonstrate:- (a) the nature of cleaning (b) General procedure in sweeping and dusting. (c) final disposal of dust.	The teacher should emphasise : (a) the characteristics of dust and dirt. (b) the dangers caused by dust and dirt. (c) reasons for removing dust, for instance for the sake of health and destructive effect on materials.	The teacher should encourage competition among the students by means of "credits" given in "points" "stars" etc. etc.,
Cleaning of Cane Work.	Explain how dirt is held by grease. Methods for removing dirt depend upon the amount and nature of the dirt, can be removed only with hot water soap, soda.		The teacher can encourage children to use grass brushes and coconut-coir brushes (made in the class)
Tarnishes.	Can be removed with ash, soft white powder, soft mud, household vinegar, lime juice and acids ; should be followed with complete rinsing.	Explain how tarnishes aı caused.	
Cleaning of Glass Surfaces.	The teacher should demonstrate how glass can be cleaned :— *Cleaning of glass windows.*		The teacher should explain the value of newspaper. Point out the difference between chamois leather and selvyt

Topics	*Method*	*Theory-points to be Emphasised*	*Points for Promoting Further Interest*
	Method (1). Collect newspapers and paraffin.		cloth—which is less expensive than chamois leather, is soft, easily washable, leaves no marks.
	(a) Make a pad of the newspaper, apply very little paraffin,		
	(b) work in straight lines across and down the windows, giving special attention to the corners,		
	(c) polish with newspaper.		(c) Collect scrap newspaper
	Method (2) Collect one *degchi* Tepid water, adding one tablespoon full of paraffin, two dusters (not fluffy) or one duster and one pad of newspaper.		
	(a) Dip the duster in water, wring out and wipe off the window.		
	(b) Polish with duster or newspaper.		
	Method (3) Collect 'degchi' of warm water, chamois leather duster to polish.		
	(a) Rinse leather in water, rub over window.		
	(b) Polish with duster. Work quickly to avoid smears. The outside should be done first to show off any		

Topics	Method	Theory-points to be Emphasised	Points for Promoting Further Interest
	marks when the inside has been finished. Paint marks can be loosened with turpentine.		
	Mirrors and pictures. Can be cleaned like windows, but be very careful to wring out the cloth very tightly so that no moisture may get behind glass.		
	The best method is to use a few drops of methylated spirit and a pad of tissue paper, polish with paper or dust.		
Painting of old tins, Clay pots. Baskets and wooden boxes in one colour.	The teacher should choose attractive colours for painting the various articles and show children how to mix colours when necessary. Before putting away, children should be taught how to clean brushes with oil and turpentine.		
Cleaning of garden tools. Arrangement of patras and thals for taking meals.	The teacher should show children how to arrange *patras* for (a) daily meals, (b) festivals, with simple decorations made of rice paste round the *thals*,		

Topics and Method to be Followed	*Theory*	*Points for Promoting Further Interest*
(*b*) *Washing Polished Wood* : The teacher should demonstrate how to wash wood—if it is really dirty. Wring a soft cloth in warm water with a tablespoon-ful of vinegar per quart ; wipe well so as to remove all greasy finger marks. Dry water well and polish with a soft clean duster.		
(*c*) *Bamboo* : Half a cubit long—painted with one colour with a "transfer" of flower or appropriate designs—make excellent vases.		
Wicker and Cane Furniture The teacher should show the children how to clean wicker and cane furniture by using a soft brush and dusting it carefully with a duster. When the furniture is very dirty, it can be used occasionally with warm soap water. When washing be careful to avoid stretching the seat. A good plan is to give support by holding a cloth underneath while washing the top. All such furniture should be quickly dried in the open-air and finished with a little furniture cream. *Brown Wicker* should not be cleaned with soap and water as this may cause stains. Paraffin on a cloth may be used and the furniture should be left in the open-air, until all the odour of paraffin has gone. Linseed oil, well rubbed off, may also be used.		Children should be taken to the cane and wicker bazaar to see how these various articles and pieces of furniture are made.

Topics and Method to be Followed	*Theory*	*Points for Promoting Further Interest*
Arrangement of the Classroom To be left to the discretion of the teacher.	Teach simple colour facts with help of colour circle : (a) Standard colours. (b) Friendly colours (complementary). (c) contrasting colours.	*Teachers, Equipment* : Make colour circle with the standard (a) 3 colours. (b) Mask 1. (c) Mask 2. P. 92 (Junior).
Painting of old tins and clay pots in two colours : To be left to the discretion of the pupil to make use of any two complementary colours and any two contrasting colours. (a) Stencils may be used with designs which interest children. (b) *Spray work* also gives very good results. The teacher should emphasise the care of brushes.		The teacher should take children to the village potters' place so that they can see how different kinds of earthen pots are made and glazed by the village potter. Children should be made to draw design in their scrap books or albums.

Grade II

* The teacher should demonstrate to the whole class the method of work, emphasise important points and write new words on the blackboard. Short notes from the blackboard could be jotted down by the children in their books for study.

Topics and Method
Cleaning and Polishing of Furniture

Method	*Theory*	*Points for Promoting Further Interest*
(a) The teacher should demonstrate how to clean wood, emphasise how ordinary everyday dusting with rubbing keeps polished wood in good condition for a long time. When necessary (not oftener than once a month), a little good furniture cream or polish may be applied sparingly. It should be well rubbed in and polished, as too much of it makes furniture	*Further points to observe in the care of polished wood* (1) Avoid heat which softens and removes the polish and causes white heat marks. (2) Avoid friction with abrasives or harsh cleaners as they scratch the polished surface.	Make children collect samples of different kinds of wood used in the home, label and keep them in the class museum. Names of wood. Where found, in India, use in the home (1) Plain or deal wood.

Arrangement and Method to be Followed	Theory	Points for promoting further interest
sticky and may give it a grey appearance. Polish with two soft clean dusters rubbed in first with a circular motion and then with the grain of the wood.	(3) Avoid spilling water on the surface, as it causes marks and may in time warp the wood. (4) Avoid spilling perfume or medicines on polished wood, as they remove the polish.	(2) Wood used for furniture. e.g. Walnut Shisham, Teakwood Rosewood, Plywood, Bamboo, Wicker, Rush, Modern table tops of plastic, measonite compressed wood made of saw-dust. Take children on excursions to "Lakhar Bazzar" to see how different types of furniture are made and how they are polished. Children can also stick pictures of different kinds of furniture in the home in their albums or books.
Test : A hand lightly passed over the surface should leave no mark. This is a good test for properly polished pieces of furniture.		

Topics and method to be followed

Explain how to remove various stains caused by paint on fabrics.		
Floor Decorations *Rangoli* : The teacher should demonstrate how to make the rice paste in one or two colours and drawn on the floor, the different		Make children do *Rangoli* designs with different colours, powder and flowers, appropriate for festivals like :-

Arrangement and Method to be Followed	*Theory*	*Points for promoting further Interest*
designs suitable for the thresholds of houses. Preliminary practice in designs could be given to the children (in their books or slates) by marking various dots and using these dots as guides for drawing the designs.		(a) Dewali. (b) Puja. (Durga) (c) Onam with coloured flowers. (d) Pongal.

Grade III

Arrangement and Method to be Followed	*Theory*	*Points for promoting further Interest*
Cleaning of Kitchen Utensils. *Brass Utensils*: The teacher should demonstrate how to clean brass with wood ash and coconut coir or grass. These vessels may be brightened up and the stains removed with a cut lemon, tamarind or *imli* and with *shikakai* powder. *Aluminium:* (a) Should be washed in very hot water with a little soap, (b) White powder (whiting), or (c) Boil up apple parings or acid fruit parings in the vessel. This helps to clean up the vessels, or (d) Clean with vinegar or lemon juice or "Khatta". Follow up with immediate rinse. (e) Very dirty vessels with black marks can be cleaned with "steelwool". *Copper:* The teacher should demonstrate how to clean copper with wood ash and cocoanut coir lemon-juice, tamarind or *imli*, vinegar and salt.		Make children collect *reetanut* and *shikakai* pods.

DAILY AND WEEKLY CLEANING OF ROOMS

Room.	Apparatus required.	Daily cleaning.	Weekly cleaning.	Special cleaning and polishing.

Topics and Method to be Followed	*Theory*	*Points for Promoting Further Interest*
Cleaning of Different Rooms The teacher should explain how every housewife should arrange the housework in such a way that every part of the house gets attention at least once a week. *There can be no hard and fast rules regarding this.* Daily cleaning would mean the necessary sweeping and dusting and polishing. Weekly or fortnightly cleaning should be more thorough.		
How to Clean Bedrooms *Daily Cleaning* : Strip the bed, leave the room to air, tidy clothing and necessary articles in the room, dust the surroundings and wood work. (In summer, scrub the floor with a wet *jharan.*) Replace the rugs and make the bed.	Elicit facts from children and draw up an "order of work" on the black board for (a) Daily cleaning, (b) Weekly cleaning various rooms, in tabular form as follows :—	Pupils may be given various "assignments" in Daily cleaning" and "Weekly cleaning" of various rooms in the teacher's quarters, or hostel, or Pupils may be made to work in groups, on various "projects" set by the teacher. The competitive spirit should be set up in the different groups.
Weekly Cleaning (1) Ventilate the room, air beddings or *takhat* remove rugs ; (2) Collect all the small ornaments, clean them and place them aside ;		

Topics and Method to be Followed	*Theory*	*Points for Promoting Further Interest*
(3) Sweep the walls, remove cobwebs from ceiling and sweep floor (scrub floor)		
(4) Clean all small furniture outside the room, polish it, if necessary.		
Polish mirrors, clean pictures on the wall and clean windows. Replace small ornaments, arrange in place.		Make children a "Time-Plan"
How to clean sitting-room.		
Daily cleaning. The same routine should be followed by *daily cleaning*.		
Weekly cleaning. The above routine.		
Making of beds,		
(a) On rising, place a chair at the foot of the bed and turn back the bed clothes over it. Do not allow them to touch the floor. Make the 'dhari" or the underlay smooth, turn the mattress from side to side, and to bottom on alternate days.		
(b) Put on the bottom sheet, right side up—larger hem at top. Tuck it in all round making "box corners".		
(c) Shake up pillows, place on bed,		

Topics and Method to be Followed	*Theory*	*Points for Promoting Further Interest*
(d) Put on top sheet right side down, large hem at top and tuck in foot only.		
(e) Put on blankets, reaching only half-way up the pillow and tuck in foot only.		
(f) Turn down top sheet over the blanket and then tuck in all round, making corners neat.		
(g) Put on bed spread, leave hanging loose. The whole bed should look smooth and neat.		
Cleaning of Footwear and Leather		
(a) The teacher should emphasise that leather should be kept free from dust, as far as possible, and explain how a little furniture polish used occasionally on leather helps to keep it in good condition.		

GRADE IV

Cleaning and Arrangement of Store Room and Kitchen

Introduction : It will not be out of place, briefly, to consider the causes of the spread of diseases in order to appreciate the necessity for a rigid practice of principles and laws of hygiene and sanitation in our kitchen.

Spread of diseases

(a) *Germs* : Diseases may be caused by germs. Diseases caused by germs are spread from person to person, through one or more of the following channels :—

(1) Through air, by inhalation of germs from a diseased man e.g. common cold, diphtheria etc. (2) Through food and drinks contaminated with germs e.g. dysentery, diarrhoea, typhoid etc. (3) Through personal contact with a diseased person e.g. skin diseases. (4) Through infected insects and parasites conveying the germs from one man to another e.g. malaria spread through mosquitoes, plague spread through rat flea.

(b) *Malnutrition* : If certain essential food factors are lacking in the diet of a person for a long time, he is liable to fall a prey to several harmful diseases.

The teacher should ask children to observe how kitchens are cleaned in their own homes and tell them the difference between daily cleaning and weekly cleaning of kitchens.

Daily Cleaning : The kitchen is usually cleaned after the last meal. In the evening, the fireplace is coated with fine mud and lime, the floor is cleaned with a wet *jharan*. The cleaning of the "chulas" is done according to its type. The fireplace is kept ready for the morning cooking.

The teacher should show children how to clean the kitchen *daily* in the following order :—

(a) Clean the fireplace.

(b) Wash the sink.

(c) Wash the "dahi" pots or jars and put them in the sun.

(d) Sweep and dust rooms methodically.

(e) Arrange washed vessels neatly on shelves. All utensils must be free from grease.

(f) Scrub the floor and tidy up.

Kitchen clothes should be boiled in washing soda and water after the last meal and hung up to dry.

It is a golden rule to see that sinks, tables, chopping blocks, *dhakla*, *Belan*, grinding stones, knives, forks, spoons etc. are cleaned immediately after the last meal.

All swill must be carefully disposed of in bins to prevent fly breeding.

Weekly Cleaning :

(a) Clean flues (this must be done in the morning before the fire is lit).

(b) Clean "chula".

(c) Tidy shelves and cupboards and wash them, if necessary.

(d) Remove cobwebs and clean the walls beginning from ceiling downwards.

(e) Clean the sink with wood ash or mud or washing soda, tidy up and scrub the floor, ventilate the kitchen.

(f) Have gully trap (if there is one) attended to by the sweeper and flush it with disinfectants.

Cleaning of the Store-Room.

Weekly Cleaning : The same method to be followed as for the kitchen.

(a) All articles should be wiped clean systematically with a wet *jharan*, if necessary, and taken out of the room. Pickles and contents of tins like cereals and *dals* should be exposed to the sun.

(b) Clean the walls working from top of the room downwards.

(c) Scrub the floor—having ventilated the room, replace tins and articles.

Making of Notes for Washing Different Surfaces in the Room

The following methods may be adopted :—

(a) The teacher should revise the various topics regarding this lesson in the class and with the help of the children write simple notes on the board which the children can copy in their own books.

(b) The teacher could also write a series of questions involving *one word answers* with which the children could fill in the blanks.

(c) The teacher should give *assignments* to children under the following headings :—

Making of Polishes :—(Notes)

Wood Surfaces : (a) varnished wood, (b) polished wood, (c) wicker and cane furniture.

Metals : (a) silver ware (ornamented), (b) copper, (c) brass, (d) aluminium, (e) stainless steel and other materials.

Stone and Similar Substances : (a) cement, (b) marbles, tiles (baked polished flooring tiles and glazed tiles), (c) stoneware (sinks, wash-basins etc.)

Other Surfaces : Glass, mirrors, leather, oil cloths, linoleums, plastics.

The teacher should give the following assignment to the children :—

Surface.	Apparatus required.	Method of cleaning.	Method of washing.	Points of interest.

Making of Simple Polishes for Wood and Metal.

The teacher should demonstrate how to make the following simple polishes for

(A) *Wood*

(1) Ingredients : 1 oz. bees wax
1 gill turpentine
1 gill boiling water

Method : (a) Shredded soap and wax, put in an earthenware jar with water.

(b) Stand the jar in a pan of hot water and leave till its contents dissolve,

(c) Beat to a cream and when it is cooled, and turpentine gradually, beat it well.

(d) Store in a tightly-corked wide-mouthed bottle. This cream can also be used on floors.

(2) *Liquid Furniture Polish*

Ingredients : 1 tablespoonful turpentine
2 tablespoonful boiled linseed oil
1 tablespoonful vinegar
1 tablespoonful methylated spirit

Method : Put these in a bottle, keep it well-corked and shake it well before using.

Polishes for wood and metal.

Kind of Wood.	Polishes.
(a) Varnished wood.	
(b) Polished wood.	
(c) Wicker and cane furniture.	

Kind of Metal.	Polishes.
(a)	
(b)	
(c)	
(d)	

(b) *For metals.* Silver polish (Liquid)

Ingredients : ½ oz. shredded soap
½ pint boiled water

3 oz. precipitated whiting
1 tablespoonful ammonia
2 tablespoonsful methylated spirit
$\frac{1}{4}$ oz. jewellers rouge.

Method : Dissolve the soap in water and cool it.

(a) Place dry ingredients in a bottle, and dissolved soap, ammonia and methylated spirit.

(b) Keep it tightly corked and shake it well before using.

GRADE V

Continuation of Cleaning Work.

Same as above. The teacher could engage children in practical work under various assignments.

Making of Notes on Management and Division of Household Work

The teacher (1) could give assignments to children under various headings and columns as shown above or (2) Could prepare a series of one word questions and answers making children fill in blanks where necessary.

Simple Household Accoun's : In order to be able to keep correct household accounts, the housewife must have a knowledge of marketing, storage of food etc. in order to be able to know that she is spending correctly on the various things necessary for the home. She must be able to keep well within her income and put aside a certain amount of money for emergency. The main necessities are food, shelter and clothes. She should set aside something for clothing, repairs, etc. and for emergencies.

GRADE VI

Practice in Cleaning and Arranging Rooms

Same as above, but in more detail and the teacher should give various assignments to children.

Making of Soap : The Cold Process.

The teacher should demonstrate how to make soap by the cold process.

Method :—Melt 3 to 4 lbs. of fat in a large bowl, dissolve half a lb. of caustic soda in $1\frac{1}{2}$ pints of water and, very slowly, stirring it well all the time, pour it with the bowl until the mixture thickens to the consistency of honey. It should then be poured into a clean mould and left for several weeks. It should be tested periodically and when ready, taken out and made use of.

The Making of Soap—The Boiling Process

Method : Weigh 10 grams of palm oil in a large dish and warm it in a water tub or degchi, dissolve two grams of caustic soda in 25 c.c. of water and add, very slowly, stirring it well.

Heat the mixture for several hours on a water bath, stirring it occasionally. When the mixture is milky and frothy, remove a little and treat it with hot distilled water in a test tube. A clear lathering soap solution will now be obtained. If the mixture is turbid, the heating must be continued. If the soap solution is clear, add strong brine and, if necessary, solid sodium chloride. This will salt out the soap. Skim off the residue. The soap, (which is granular) should be boiled with a little water to make it smooth and allowed to set in a small dish lined with muslin. When set, it should be tested for lathering properties with hot and cold water. The teacher should compare this soap with the bazar soap and let children make a comparative study of (a) soap, (b) *reetanut*, (c) *shikakai*.

Simple Polishes : As above.

Use of Disinfectants : Besides telling children about the value of the common disinfectants like potassium permanganate, dettol, phepyl etc., the teacher should also point out the value of neem, eucalyptus leaves, *tulsi*, sandalwood and other fumigants (like *lo'an*, *samagri* etc.)

Household Pests and Their Elimination

The teacher should point out the need for keeping every part of the house neat and clean leaving no dirty dishes, scraps of food lying about and the need for cleaning store rooms and box rooms regularly in order to avoid household pests :—

(a) Mice and Rats

(i) Leave no food accessible.

(ii) Keep a cat, if possible.

(iii) Use traps.

(vi) Close up all holes.

(v) Use rat poisons.

Special care should be taken in the matter of using rat pore if there are children or pets in the house.

(b) Cockroaches

Sprinkle Borax and D.D.T. powder near the fireplace and shelves which attract cockroaches.

(c) Ants

Prevention : Cover all sweet food, stand legs of tables and meatsafes in basins of water. The following mixture may be useful to get rid of them :—

70 parts paraffin,

15 parts turpentine oil and 1 part tar oil.

(d) Furniture Mites

The furniture mite appears to the naked eye as a tiny whitish speck. It sometimes appears in great numbers in damp houses and may be noticed when newly upholstered furniture is installed. It is found, too, in pantries and store rooms.

Prevention : Strive to secure dry conditions.

Remedy : Any room in which the mite is found should be fumigated by burning about half a pound of sulphur to each 500 c. ft. of space. The best way of doing this is to use an old iron tray or *thali* on which sulphur should be placed over a pail of water. Sulphur should be lit—the live cinder will be found a great help in this connection. All bright objects such as brass and furniture as well as all carpets and rugs should be removed from the room before fumigating it.

Carbolic acid is an excellent treatment for floors and woodwork in rooms affected by the furniture mite. Wash floors etc. with water containing disinfectants.

(e) Moths

The larva of the moth is responsible for damaging clothes, carpets, blankets etc.

Prevention : Wash, clean and brush all clothes before putting away. Air clothes and blankets and winter clothes in sunshine, shaking and turning occasionally. When putting away articles, wrap them in newspapers (the newspaper ink is loathed by moths). Dried neem leaves should be sprinkled between the folds of clothes. A little D.D.T. Powder sprinkled on paper over the garment is a great help. Camphor or naphthalene balls may also be used for this purpose.

(f) Silver Fish

These insects are about half an inch long and are covered with silver scales somewhat like a fish. They come out at night and dart about rapidly. They are found in store-rooms, in cupboards among books and photo frames and papers. They like starchy food and warmth.

Remedy : Boric acid is particularly effective for these pests.

Pills can be prepared using the following ingredients :—

5 parts flour

1 part boric acid

1 part common salt

Place pills of this poison bait on a piece of paper near the crevices where the insects lurk.

(g) House Fly

The teacher should emphasise the need to keep all foods covered ; use sprays containing D.D.T. (10%), fly paper or fly traps and all useless swill. *Fly traps* may be improvised as follows :—

(i) Cut a slit on all four sides of a ghee tin. Fill it with mud up to 1" below the level of the slit. On top, fit in a removable lid with an inverted funnel and a cylinder both made of wire-gauze. This is made out of two ghee tins. Take a ghee tin. Place it lengthwise. Cut slit on both sides.

(ii) Half size tin with slit on two sides. Top fitted with inverted wire-gauze funnel surrounded by a rectangular tin with sides cut and fitted with mosquito netting.

(iii) Full size ghee tin with slit on all the four sides. Tight fitting lid studded with small holes for light. Creosol, lotion: Gunny screen. A tin tray in the bottom. Fit a wooden frame upright from the sides of the tray. Have a gunny screen stitched on the frame. The frame should have a handle to rotate the screen. Pour creosol solution in the tray and rotate the handle. The screen then gets wet and the flies sitting on the wet screen get killed because of the creosol solution.

Tangle-foot: Application of tangle-foot solution. Tangle-foot may be used as under :—

(i) On twisted wire with tin at the bottom usually to collect dripping hung on doors, roofs, etc.

(ii) Apply on glazed paper and leave on tables.

(iii) On tins cut open with sides turned outwards.

Apply on the sides and inside of the tin.

Preparation of tangle-foot :

(a) Eight parts powdered resin, five parts castor oil. Heat in a degchi. Not boiled. Stir with a stick. Mixture is fluid.

(b) Linseed oil in lieu of castor oil. Boil ingredients separately. Mix thoroughly. Bring to boiling. Boil for 15 minutes.

(c) Quantity of resin varies according to temperature.

Increase during summer.

Grade VII

Making of soap and simple polishes. Cleaning of metals. Making metal polishes.	same as above, but in more detail.

The children should work in groups.

Suggestions: Projects on

(i) different kinds of *chulas* and *angithis*,

(ii) labour-saving and fuel-saving devices,

(iii) various assignments and projects—preparing things for and arranging a tea party etc.

The teacher should insist on correct planning and systematic work and see that the children tidy up carefully after the work is completed.

GRADE VIII

Same as above, but in more detail. The teacher should expect leather work and greater efficiency.

Budget of Family Income and Expenditure

Grades VII and VIII. Study of different kinds of cooking ranges (a) wood fuel, (b) oil and water.

Suggestions : Household repairs.

(1) How to repair a frayed flex.

(2) How to renew an old water-tap washer.

(3) How to mend a fuse and plug.

LAUNDRY WORK

Grade I

INTRODUCTION : The teacher, as far as possible, should correlate this subject with spinning and weaving, so that the children can understand the structure of different kinds of textiles.

TOPIC. *Washing of rough cotton articles* e.g. towels, *jharans* etc. The teacher should have two sets of clothes, one dirty to show the washing process and one washed to demonstrate the folding.

Time	*Activity.*	*Teaching and watching*	*Points for emphasis.*
	Preparation. Collect and sort the clothes into various heaps, the more dirty ones together, and the less dirty ones separately.	Discuss the value of cleaning *jharans* and towels.	
	Mending. Draw any large holes tightly together.	Point out the value of mending before washing.	To prevent increase in the size of holes during washing.
	Steeping. (a) Soak all white clothes in cold water. (b) Put the *jharans* and dirtier articles separately in a "Balti" in hot water. Add a little (about 2 tea-spoonfuls) dissolved washing soda. (c) Soak clothes for 12 to 24 hours.	Explain how all white fabrics will cleanse more easily if they are steeped for some time before they are washed. (a) Steeping wets the fabric and removes non-greasy dirt. (b) It is best to steep overnight if possible. If not, a short steep should be given. This saves time, labour and soap. (c) Rub soap on any soiled parts of fabrics before steeping. (give reasons).	

Time	Activity.	Teaching and watching	Points for emphasis
	Washing Jharans. The teacher should show how to wash *jharans* by tne friction method. Use the scrubbing brush and a cake of soap. Show how the brush should move over the *jha an*.		After use, rinse the brush well with clean hot water and hang it on a wall or keep on a shelf with the bristles down.
	Rinse well, wring and dry it in the sun on the grass.	The teacher should point out value of the sun and grass as whitening agents to the *jharan*.	
	Folding of Jharans		
	Fold it lengthwise.		
	Washing of Towels. The teacher should demonstrate to the children how to wash towels with the help of a rubbing board. Place the rubbing board in a tub of water and soap the towel well with a cake of soap, rub one part of the towel with the other part over the corrugations of the board. This causes a permanent lather in the part of the material being rubbed. Work over the whole of the article in this way, rinse well in warm water.		Point out samples of different kinds of rubbing boards e.g. wood, galvanised tin, glass. Explain how rubbing boards can be easily made in the wood work class. The rubbing boards must be washed with clean hot water after use and dried.
	Blueing of Towels. Explain how blue is the complementary colour to yellow to produce whiteness in the fabric. Show children the different kinds of blue, the best for home use is the ultramarine. (a) Squeeze the blue bag in cold water		Blue is used in the last rinsing water for towels and white cottons, as it helps to keep their whiteness. These fabrics tend to become yellow through use, wear and washing. Do not take the water too blue as it may

Time	Activity.	Teaching and watching	Points for emphasis
	until the water is a pale blue colour. (When the water is lifted, it should be the colour of the sky). (b) Stir up the blue water just before use. (c) Open twisted towels. Dip towels in, lift in and out two or three times, and wring. See towels and garments should not be left standing in the blue water. (d) Blue should not be added when garments are in the water.		make the towel grey. Stir blue water that has been standing before using it again. The following experiment on blues will be helpful to the teacher:— Divide children into groups and make them do the following experiment:— (1) Look at a cube of laundry blue. (2) Make a blue bag, take an oblong piece of strong calico and fold it into a square, place the cube in this and tie securely. (3) Dip the blue bag in cold water in a small basin, squeeze out, and leave the blue water standing for half an hour. Note what has happened.
	Wringing of Towels.		
	Drying of towels, in the sun on the grass.	Point out the value of the sun and grass.	
	Finishing of Towels.		
	(a) Fold them lengthwise, bring selvedges together.		
	(b) If fringed, beat fringes well, or comb them evenly with a metal comb,		

GRADE II.

Washing of Cotton Articles e.g. Tea-pot Cover s. Napkins Kurtas,' *Dupattas* etc.

Some process as applied to washing of towels, namely—

(a) Collecting and sorting.

(b) Mending.

(c) Removing of stains.

(d) Steeping.

(e) Washing.

(f) Rinsing.

(g) Blueing.

(h) Wringing and drying.

GRADE III.

Washing of Linen:— As above.

Cleansing.

(a)	Temperature of water— 100° 110°F.		
(b)	Cleansing agents	—	Reliable laundry soap in solution or soap flakes.
(c)	Method	—	Suction or kneading and squeezing.
(d)	Boiling	—	Usual method used for white linen. For unbleached linen boiling is not practised.

Washing of Silk.

(1) The teacher should keep all washing equipment ready before demonstrating the washing of silk.

Preparation: Mend garments, discoloured white silk can be steeped in warm water with a little dissolved borax for a short time before washing.

(2) Remove stains when fresh, as stains dried in silk are difficult to remove. Stains on white silk can be removed by dipping them in milk and keeping them there until the milk sours, as this is often very effective and does not harm the fabric. Lemon juice or juice of *Katta* is also useful in removing most stains on silks.

(3) *Washing:* Prepare warm soapy water using soap solution or soap flakes like Lux or Godrej soap powder to make a lather. Use sufficient soapy water to cleanse. The cleansing must be done by kneading and squeezing and by hand for small garments. Put extra soap solution through the soiled parts. It is impossible to see through dark coloured silk or clean velvet ; so note the soiled part before wetting the cloth by tacking it with needle and thread and squeeze extra soap solution through them during washing. Rinse it in warm water to remove soapy water. This is most important, and if the water is not warm enough to dissolve the soap, a fine white powder is formed on the surface of the

silk. When this is ironed, greasy marks are left on the silk. Rinse it finally in cold water, add a little juice from a lime or vinegar, one tablespoon in a large basin full of water. This clears the colours and stiffens the silk.

How to Make Gum Solution.

(4) *Stiffening* : Silk seldom needs to be stiffened as it usually becomes stiff when ironed damp. If thin silk needs to be stiffened, use a little gum solution. Dilute some liquid gum with water and squeeze the silk in this.

Another way is to steep one ounce of arabic gum in one cup of cold water in a stone *katori* or jar overnight. Place the jar in pan of water, heat till the gum arabic is dissolved. Strain and bottle. Use one teaspoonful to half a pint of cold water, as the last rinse.

(5) Remove all moisture. Squeeze the cloth by hand. Thin silks can be wrapped in a cloth and rolled up for half an hour before being ironed.

(6) *Drying* : Dry the cloth in a shady place as sunlight tenders silk and causes white silk to become yellow. Thin silks do not need to be dried. Thick silks need to be half-dried. They can be wrapped up in damp turkish towels and kept ready for ironing.

Introduction to the Four Fundamental Fibres.

Fibres may be classified under two main classes:

(1) Natural e.g., cotton and linen.

(2) Animal e.g., silk and wool.

Vegetable fibres : The teacher should give a short history of cotton and linen explaining their origin, their sources and manufacture. The following experiment could be done in the class by the children so as to explain the structure and reaction of the fibres.

The single linen and cotton fibres should be examined under a magnifying glass, better still under a microscope. This will enable the children to see the natural twist in the cotton fibre and the long linen fibres which have nodes at intervals giving it the appearance of a bamboo.

Experiment : Six bowls of similar size, six pieces of soiled cotton or six pieces of soiled linen of equal size are required.

Use some quantity of water in each bowl.

Keep as the piece No. 1, it is for comparison.

Steep No. 2 in cold hard water.

Steep No. 3 in cold softened water.

Steep No. 4 in hot water.

Steep No. 5 in cold softened water with 1 oz. of washing soda dissolved in one gallon of water.

Steep No. 6 in cold softened water with 1 oz. of soap dissolved in one gallon water.

Leave each material in for the same length of time. Examine the materials after steeping, compare each one of them with the piece No. 1. Decide which method of steeping is the best.

Friction Washing : Prepare six evenly soiled pieces of each material as in the previous experiment, each piece should be about six inches square.

Use the same quantity of water in each case.

Keep the piece No. 1 as it is for comparison.

Wash No, 2 by rubbing it in cold water.

Wash No. 3 by rubbing it in hot water.

Wash No. 4 rubbing in cold water with soap.

Wash No. 5 by rubbing it in hot water with soap.

Use the same number of rubs in each case. Rinse it six times in hot water, put it into softened soapy water when nearly boiling. Boil it for 15 minutes.

Examine all the pieces and decide which is the best method for removing non-greasy dirt from white cotton and linen.

The removal of greasy or fixed dirt from cotton and linen : Prepare soiled greasy material by using powdered charcoal mixed with soft dripping and brush it on the fabric. Repeat the two previous experiments and decide which is the best method of steeping and washing greasy materials.

Animal Fibres—Wool and Silk

The teacher should give a short history of the origin of wool (narrate briefly the story of the Golden Fleece), give the chief wool producing countries in the world today and explain how wool is manufactured in India and abroad.

Silk. The teacher should narrate the story of the Chinese Princess who first made silk in China about 4,000 years ago and say how the secret of its manufacture passed out to other countries. It may be pointed out that silk is used for certain sacred ceremonies like *Upanayana* or sacred thread ceremony, for weddings, for festivals and for *Puja*. The teacher should also explain the manufacture of silk and show children the different varieties available e.g. the *Eri* silk, Moga, Tussore, Kashmir, Bangalore and other types of silk available. The children should be taken to a silk factory, if there is one in the vicinity.

Appearance and Structure : The children should examine the fibre of silk and wool under the microscope, if possible. The difference between their structure should be noted, that there are overlapping scales on the wool fibre and it is curly while the silk filament is fine, straight and smooth.

Burning :—Burn equal-sized pieces of silk and wool. Note the rate of burning, the type of ash and the smell.

Feel :—Feel a skein of knitting silk and a skein of wool.

Grip the skeins in the hand and notice the elasticity of the wool and the scroop of the silk.

Absorption

(1) Place pieces of wool and silk on plates. Put one drop of water on to each. Notice the rate at which it is absorbed in each case.

(2) Place equal-sized pieces of wool and silk on top of basins of water. Notice which sinks first. The effect of laundry washing materials :— Take seven equal-sized pieces of white silk and wool material. Use the same quantity of liquid in each case. Leave each piece in the liquid for five minutes.

Leave No. 1 as it is to compare the other pieces with.

Place in No. 2 Borax solution (1 ounce to 1 pint of water).

Place No. 3 in Ammonia Solution (1 tablespoonful to 1 pint of water).

Place No. 4 in washing soda solution (1 oz. to 1 pint of warm water.)

Place No. 5 salts of lemon (1 oz. to 1 pint of hot water for five minutes followed by Borax, 1 oz. to 1 pint of hot water for five minutes).

(6) Place No. 6 in Javelle water (equal quantities of Javelle water and hot water).

(7) Place No. 7 in Hydroeen peroxide (½ gill to 1 pint of water with 1 teaspoonful of Ammonia added).

Rinse all in warm water. Pin on to a cloth in order and dry carefully. Press lightly.

(1) Compare each piece with the piece No. 1 and observe if there is any change in colour or texture of the fabric.

(2) Conclude as to the reagents that are suitable for use on silk and wool.

(3) Replace the expreiment done previously on stain removal. Decide how to remove common stains from silk aad wool.

The Effect of Washing Process on Silk and Wool

Take eight pieces of white silk and white wool material, each four inches square.

Keep No. 1 as it is with which to compare the other pieces.

Perform the experiments on other pieces as indicated below.

Examine the result of each experiment before doing the next.

Effect of Steeping

Steep it in cold water for several hours, overnight if possible.

Effect of Heat

(3) Steep it in warm water for ten minutes.

(4) Steep it in very hot water for ten minutes.

Method of Washing

(5) Wash it in warm water by rubbing on soap.

(6) Wash it in warm water and soap solution by squeezing. Rinse these two pieces in warm water.

Temperature of Iron

Rinse it in warm water.

(Use a hot iron having the same temperature as that used for cottons).

Place a warm iron (that does not scorch when held on tissue paper whilst counting six on it). Decide which iron is suitable for wool and silk.

Make children tabulate the experiments as follows in their note books.

PROPERIES OF FIBRES

Experiment.	Cotton.	Linen.	Wool.	Silk
Description, cost and width.				
Burning.				
Rate of absorption of water.				
Effect of boiling.				
Method of laundering.				

Grade IV

Laundering of wool.

Method and organisation of class : Same as above. The teacher should follow a time-plan, have two sets of clothes, one dirty for washing and other, a clean one, for folding.

Time	*Activity.*	*Teaching and watching*	*Points for emphasis. (Write on the black board, if necessary.)*
		The aims of washing woollens are (a) to keep them soft and fluffy, (b) to preserve elasticity, (c) to retain original shape and size of article.	
	Preparation : Collect equipment for (a) mending, (b) sorting as follows : (i) all whites together, (ii) light colours together, (iii) articles with deep colours, (iv) articles with coloured embroidery. (c) removal of stains.		(1) Borax and salts of lemon can be used in warm solution (2) Javelle water should only be used. Wool can be bleached by steeping for several hours in one pint of warm water with half a gill of hydrogen peroxide and a few drops of household ammonia. Grease spots on wool can be removed before washing because of the coolness of the washing water. These can be absorbed by (1) a powder—like French chalk or (2) a blotting paper and a warm iron, (3) using benxine or petrol.

Washing. Just before washing, the teacher should mark the outline of the woollen garment on a newspaper. The teacher should explain why one garment at a time should be washed, rinsed, and put up to dry before another is wetted.

Time	*Activity*	*Teaching and watching*	*Points for emphasis, (write on blackboard if necessary.*
	Prepare washing water—(it should be warm and soft). Good laundry soap made into solution or soap flakes must be used to make a lather.	*To soften water* :— (a) Household ammonia can be used in hard water for washing white woollens. Proportion : one tablespoonful to one gallon. (b) Borax may be dissolved in hot water and used in very hard water for washing white and coloured woollens. Proportion : one teaspoonful to one gallon. This prevents wastage of soap. The teacher should give reasons for the use of lukewarm water for washing. Very hot water washes out the natural oil of wool and makes it hard while cold water shrinks wool.	Same as Col. 2.

The teacher should demonstrate the method of washing woollens by *Kneading and squeezing*, very soiled parts of garments can have extra soap solution patted through. Use sufficient soapy water to cleanse the garment.

Rinse twice in warm water making sure that all the soap has been well rinsed.

Washing and rinsing waters must be of the same temperature. Blue white woollens, if necessary.

Blue must be used very sparingly, as wool is very absorbent. Woollens are easily overblued.

Wringing. Squeeze out water as much as possible, fold the garment in a turkish towel and beat off all moisture.

Drying. Spread the woollen garment on the outline on the newspaper. Put it on a charpoy or the tilted back of a plain wooden chair. Dry in the verandah where the warm dry moving air will evaporate the moisture quickly.

Shake whilst drying to keep the woollen garment soft and in good shape.

Dont's in washing woollens.

(1) Don't soak.

(2) Don't use too much soap.

(3) Never boil.

(4) Never twist when wringing, as the thread may break.

(5) Do not iron knitted woollens.

Finishing. Woollens that have been properly washed and dried need a little finishing.

Knitted woollens are pressed with a cool iron on the right or wrong side. Dark coloured woollens are finished on the wrong side to avoid glass. Woollens with a fluffy surface should be shaken during drying, and brushed up when dried with a laundry brush.

Washing and Laundring of Cotton, Linen and silks.

To save time the teacher should have two sets of cotton articles for (a) washing, starching and blueing, and (b) washed articles to demonstrate ironing and finishing.

Preparation :-

(a) Preparing starch }
(b) Preparing boiler } Details see below.

(c) Mending and sorting garments

(d) Stain removal. For details see chart on stain removal.

Put questions on stain removal and demonstrate methods if necessary by making use of indigenous products
(1) *kambrak*, (2) *nimboo*
(3) *tomatoes*, (4) *dahi*.

1, 2, 3, 4, Remove ink stains.
Method : Cut 1,2, & 3 and apply it on the ink stain, leave for half an hour. Wash with soap and water. Dry in the sun.
Dahi : Same method.

(e) *Washing.* Teacher to demonstrate the *friction method* of washing—make use of Rubbing Board and soap.		
(f) Boiling—white cotton and linen (see below).	Point ont the necessity of boiling bag. A boiling bag can be easily made from an old pillow case— (1) Cut the two corners and hem these two openings, let in the soapy water. (2) Pass string through opening at the top. for tying.	
(g) *Rinsing* in warm water to remove the hot soapy washing water. Rinse several times in cold water to keep the fabrics white.		
(h) *Blueing.* Same as above.		
(i) *Starching.* See below.		
(j) *Wringing and drying.* Take starched fabrics when quite dry.		
(k) *Damping.* Damp teapoy covers, emphasise the process of damping the edges and stretching to shape.	The clothes must be in the correct condition for ironing. They must be damped, folded and rolled down tightly so as to allow dampness to pass evenly through.	Do not have damp clothes rolled down overnight, as mildew may develop.
(l) *Ironing.* Demonstrate the correct method of ironing. (a) Double parts on the wrong side, (b) Iron to travel in straight lines at right angles, work from		Teacher should also show children how to prepare coal irons and test heats of irons for ironing.

border inwards, (c) iron on the right side, with the warp threads where possible from right to left.

(m) *Folding.* The teacher should demonstrate :

(i) The *four screen fold* on teapoy covers and show other fancy folds,

(ii) the *three screen fold* on napkins,

(iii) the "chunnatt" style on *dupattas.*

Practice Class. The children to be given special duties to tidy up and put away things in proper places. The teacher should follow the same method as above, showing children the variations in the strength of starch used for varions household fabrics like napkins, *kurtas*, *dupattas* and caps.

For Gandhi caps, cold water starch should be used. The teacher should demonstrate how to make cold water starch, and point out the difference between cold water starch and boiling water starch. The teacher should also practise the children in laundering embroidered household articles.

Processes such as boiling, preparation of starch, soap solution, blueing :—

Preparation of boiler : Fill two-thirds of the boiler with water, add a teaspoonful of washing soda to one gallon of hot water. Add two handfuls of shredded soap to one gallon of water.

Value of boiling. Whitens clothes (2) removes stains (3) disinfects clothes.

Boiling. The cleanly rinsed clothes should be put into the boiler in softened soapy water before the water reaches boiling point, and left until the water has boiled for 75 minutes.

It is very important to see that there is no scum on the boiler, because if this scum is left and allowed to boil into the mesh of the fabric, it causes discoloration, and damages the threads.

Preparation and use of starch.

Boiling water starch :
Ingredients : one tablespoonful of starch
two tablespoonfuls of cold water
one point of boiling water.

These quantities should make sufficient starch for a family of four members.

Method : Pour one tablespoonful of starch into a bowl. Add two spoonfuls of cold water, mix with a wooden spoon to a thick cream consistency. Pour boiling water over this paste, stirring quickly the whole time and notice when a change of colour occurs. Stop pouring as soon as the change is noticed, for this shows that the starch grains have burst. This is full strength starch. It is diluted with cold water as required. This is 1:1 strength starch and can be kept till required for use. 1:1 means one part starch and one part water.

Table of common starch requirements :

Table cloth : 1 : 12 (Damask).
Table cloth, silk or rayon : No starch.
Tea Cloth (cotton) : 1 : 6
Table napkin : 1 : 16
Tray cloth : 1 : 3
Tea Cosy covers : 1 : 2
Duchesse set : 1 : 4
Lace : full strength.
Dinner mats : 1 : 4
Printed *Kamiz* : 1 : 8
Printed blouse : 1 : 12.
Shirt collar : 1 : 1

border inwards, (c) iron on the right side, with the warp threads where possible from right to left.

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Duchesse set : 1 : 4
Lace : full strength.
Dinner mats : 1 : 4
Printed *Kamiz* : 1 : 8
Printed blouse : 1 : 12.
Shirt collar : 1 : 1

Shalwar : 1 : 6

Dopatta : 1 : 5 or 1 : 6

Gandhi cap : cold water starch 1 : 2.

Cold rice water starch can be made as follows :

1 oz. starch
1 tablespoonful of boiling water.
½ teaspoonful borax.
½ point cold water.

Method : Dissolve Borax in boiling w ter. Add cold water to dissolve Borax and pour this on the starch, mix to a smooth paste, strain through muslin, leave half an hour before use. This allows the starch grains to stiffen. Stir thoroughly before use.

Use. It is used to make thin muslin articles such as men's collars Gandhi caps, very stiff, etc. The material must be dried for this type of starching. Knead and squeeze the dried material, so that it will absorb the starch grains properly. Squeeze out. Rub off surface starch grains with a damp piece of muslin, iron immediately with a hot iron moving the iron quickly over the material. Even pressure bursts the starch grains. Iron the material to dryness.

Making of soap solution.

Bar soap may be used to make a permanent lather with the washing water for all types of cleaning other than washing.

Preparation : Add 4 oz. of soap to 1 pint of water.

Method : Grate the soap. Stew it in the water for a few minutes, until a clear liquid is obtained. Avoid its boiling over. Scraps of soap can be saved and converted into jelly.

Stain removal : General information regarding stain removal :

(1) All stains are mostly removed when fresh.

(2) Unknown stains should be treated by the least harmful methods, e.g. (i) cold water steep (ii) boiled water steep according to fabric. This can be followed by mild reagents like Borax etc.

Name of Stain	*Fabric.*	*Method of removal*
Tea and coffee	Cotton and linen	(i) Pour boiling water through the stain immediately it occurs, wash and boil.
		(ii) Spread about a teaspoonful Borax over the stain, pour boiling water through.
		(iii) Bleach with the Javelle water.
	Wool, silk and rayon.	(i) Steep in a warm borax solution :
		(ii) Steep in a warm hydrogen peroxide solution.

Name of stain	*Fabric*	*Method of removal*
Curry stains	Cotton and linen	(i) Wash with warm water and soap, spread the fabric in the sun on the grass. (ii) Wash with warm water and soap, use a little household ammonia, rinse well and dry in the sun. The grease stain will go off with hot soapy solution. If not, place blotting paper over and above the stain and press with a hot iron.
Pan and fruit stains	Bleached cotton and linen	(i) Spread borax over the stain, pour boiling water through. (ii) Treat with Javelle water. (iii) Treat with potassium permanganate solution (hot). The brown mark made by the solution may be removed by the solution (hot) of Oxalic acid.
	Silks.	(i) Steep in a warm solution of sodium perborate. (ii) Steep in a warm solution of hydrogen peroxide.

GRADES V AND VI

Dyeing of Dupattas.

Introduction : The teacher should explain briefly the different kinds of dyes (i) dyes meant for cotton and rayon (ii) dyes meant for animal fibres like silk and wool. The teacher should also demonstrate to children how to strip garments of dyes before dyeing them with the desirable colours.

The teacher should emphasise the need to follow the directions given below in order to make a dye successful :—

1. Make up the dye in an old enamel pan or bowl ; be sure that all dye powder is dissolved ; strain it through muslin to make certain of this.

2. Test the shade of the dye with a small piece of material te be dyed, before putting in the whole garment.

3. Sufficient dye must be made to allow the garment to flat, so that the dye liquid passes evenly through the material, or dyeing will not be even.

4. The article must be clean and evenly wet. Immediately the garment has been put into the dye, begin moving it with two sticks and keep moving the whole time the material is in the dye.

5. Leave the garment into the dye until the colour is sufficiently deep, remembering that it will dry much lighter.

6, Rinse it in clean water until no colour leaves the garment.

7. Wring it out.

8. Finish it according to the kind of material.

Management of family washing.

The teacher should point out disadvantages of the Dhobi's wash or the wash done in a laundry. Washing done at home makes the clothes last longer, keeps the clothes fresh and this is, therefore, economical in the long run. The following factors must be borne in mind :—

(1) CLEASING MATERIALS NEEDED FOR A FAMILY WASH

(a) Water: A plentiful supply of hot and soft or softened water is required. Housewives who live in the districts where water is hard must see that the water is softened first.

(b) Soap : Soap jelly, soap flakes or soap powder.

(c) Starch }
(d) Blue } A store of these can be kept in the house.

(e) Material to remove stains.

Programme for the day before the wash.

(1) Collect the clothes, examine them, and mend any large holes or thin places in sheets and blankets. Stop ladders in knitted fabrics, darn table linen.

(2) Separate the white cottons and linens into bed linen, table linen, personal garments, handkerchiefs, and household clothes.

(3) Remove iron rust stains.

(4) Steep each group of clothes separately, making use of the washing apparatus for this.

(5) Remember to steep handkerchiefs by themselves in cold water with some salt.

(6) Grate soap for preparing soap solution.

(7) Plan the midday meal for the wash-day.

Programme for the wash day.

1. Start washing early ; remember the heating of the water.

2. Dissolve the grated soap in the water to make the soap solution.

3, Make starch.

4. Treat stains according to their type.

5. Wash woollens first whilst the water is heating and before any soda or wash powder has been used for water softening. Woollens need a long time for drying, so you should be up to dry early on the wash day.

6. Wash silks and rayons and coloured cottons next, as these are quickly washed and will be ready for finishing later in the day.

7. Wash the white clothes in groups, keeping all of one kind together throughout the whole of their washing, boiling and rinsing. Begin by washing the table linen and putting it into the boiler, next the bed linen, changing the water when necessary. Then wash the personal garments and handkerchiefs. Wash and boil the household clothes last. Rinse very well with hot water after washing and boiling. This should be followed by rinsings in cold and blue waters, and by starching, if necessary.

8. Clothes should be dried out of doors where possible.

9. Wash and dry all apparatus, being careful that all metal apparatus is quite dry before it is put away.

10. Put away stores.

11. Empty and dry the wash-boiler, keeping a bucket of water for cleaning the floor of the kitchen where washing was done.

Finishing

This constitutes folding and pressing all plain house-hold articles, and ironing all other clothes.

1. Take silks, rayons and woollens as ready for finishing, fold and put into the clothes basket.

2. Take unstarched cottons when half-dry, fold, mangle after the washing is finished, and put to air on ceiling airer or clothes-horse.

3. Take down starched clothes when dry. Damp and roll down if they can be finished on the wash day, if the housewife is too tired to finish these on the wash day, they can be left dry till the next day, damped, and rolled down for half an hour before being ironed.

Practice in managemet of family washing :

Same as Grade V.

Practice in the removal of stains :

Follow the instructions given below :—

Ask children to bring various stains that are at least one week old and do experiments on stains removal in class, and mount samples in their books.

Tabular form given below could be followed :—

Sample showing stain.	Kind of animal	Fabric vegetable	Method followed	Sample after Animal	Treatment vegetable

The following table of stain removal will be of use to the teacher :—

Stain	*Reagents required*	*Method of Application*
Coffee	Borax	soak washable fabrics for a short time in warm solution of borax. In the non-washing fabrics, sponge them with borax solution and allow to dry. Remove grease stains with a grease solvent.
Egg	Lukewarm water, possibly a grease solvent.	Sponge with luke-warm water, and if the garment is not to be washed and a greasy stain remains after drying, rub with a cloth dipped in carbon tetrachloride.
Fat, grease and oil	Grease solvent	Rub gently with a cloth dipped in the solvent.
Fruit	Borax	Soak for a short time in warm solution of borax.
Grass	Methylated spirit	Sponge gently with the spirit.
Gravy	Grease solvent	Sponge with cloth dipped in solvent which will remove greasy part of the stain. Washing will generally remove any discoloration remaining.
Ink	Oxalic acid, or potassium permanganate, followed by hydrogen peroxide or Oxalic acid.	If marks occur on white linen or cotton, sprinkle with oxalic crystals and then boiling water over. If marks are on coloured, especially non-washable fabrics, treat with dilute sclution of potassium permanganate, using about ½ teaspoonful to 1 pint of water. Apply this solution immediately over the mark, using a glass of any other smooth rod. After a second or two rinse or blot away the solution with fresh water. The brown stain remaining can be removed by treatment with either hydrogen peroxide or oxalic acid. Use the former for silk, wool and delicate fabrics, diluting it three or four times with water. When using oxalic acid, dissolve a teaspoonful of the crystals in ¼ to ½ pint of water. Repeat this tr atment several times if necessary. Rinse thoroughly.

Stain	*Reagents required*	*Method of application*
Ink	Citric acid	A very obstinate stain which cannot be easily removed. Sometimes can be dealt with successfully by treatment with citric acid solution.
Ink (marking)	Potassium permanganate followed by oxalic acid or hydrogen peroxide.	Treat as for writing ink. Marking ink stains are, however, very resistant, and it is sometimes necessary to repeat the treatment a number of times. Finally rinse well.
Ink (red)	Borax solution methylated spirit.	Soak for as few minutes in warm solution of borax in water. If this treatment is not effective, try methylated spirit.
Lodine	Photographer's hypo	Dissolve one tablespoonful of hypo in $\frac{3}{4}$ pint of water. Apply immediately over the mark.
Jam	Warm water, borax	Sponge marks with warm water. If the fruit stain remains, soak or sponge with a little warm borax solution.
Juice, fruit	Borax	Sponge or soak in warm solution as directed above.
Juice, meat	Salt and water	Soak for a few minutes.
Mildew	Potassium permanganate, followed by hydrogen peroxide or oxalic acid.	Mildew stains are among the most obstinate of all to remove, and demand a good deal of patience. Treat as for ink stains, rub over with washing soap and leave in the sun. Rinse the soap out. Repeat until stains disappear.
Mill	Warm water, followed by grease solvent in case of non-washing fabrics.	Sponge marks with warm water ,and on drying apply grease solvent if articles are not to be washed and any grease marks remain.
Paint	Turpentine or petrol. Paraffin can be used for coarse articles.	Paint marks can be removed easily, if fresh, but may demand repeated application of solvent, if old.
Permanganate	Hydrogen peroxide or oxalic acid	Apply solution diluted as directed previously, and rinse well afterwards.
Rust	Oxalic acid	Apply as directed for ink.
Scorch	Warm, soapy water and borax	Slight surface scorch marks can generally be removed by rubbing affected

Station	*Reagents required*	*Method of application*
		part in warm soapy water containing a plentiful amount of borax. Alternatively scrub gently with a nail-brush dipped in soapy water and borax. Be careful, however, not to rub fabric into a hole. There is no remedy other than invisible mending for bad marks.
Soot	Carbon Tetrachloride	Never treat soot marks with water, but try carbon tetrachloride.
Tea	Treat as for Coffee.	

GRADE VII.

Dry cleaning

The teacher should point out the difference between "wet" and dry cleaning—and the value of each. Dry cleaning is used for cleaning garments that cannot be washed. This can be done by two methods (a) by powder cleaning, (b) immersion.

Powder cleaning

It is suitable for removing grease spots from all types of fabrics; for treating light-coloured fabrics that are evently soiled. The different powders used for this purpose are (a) French chalk, (b) Fuller's earth, (c) Bran.

Method : (i) Shake and brush loose dust from the garment.

(ii) Spread a thick layer of the powder over the garment and rub in lightly.

(iii) Leave for half an hour to let the powder absorb grease.

(iv) Brush out.

Bran is useful for cleaning dark felt hats and dark furs.

Method : Heat the bran in a *kardhi*, stirring to prevent its burning, rub into the material, leave for half an hour, shake, brush out.

Immersion. The teacher should show the samples of the various kinds of grease solvents and explain the advantages and disadvantages of each one of them. He should emphasise also how the principle underlying their use is the same in both cases, but the method of use varies because of the inflammability of petrol.

Method : The garments can be put completely into liquids that will dissolve grease such as petrol, benzene etc.,

The teacher should demonstrate the cleansing of garments by petrol, squeeze out as much petrol as possible, then wrap in a turkish towel and beat. Then hang outside to dry until the garment is free from the smell of petrol. Press when thoroughly dry.

The teacher should also explain how used petrol could be saved and stored away. He should also point out the need to store it in a closed tin away from the fire or warm places.

Disinfection of clothes. The teacher should briefly explain when and how disinfection of clothes should be carried out in the home. Clothing to be disinfected may be divided into two groups.

(1) Those that can be disinfected by boiling.

(2) Those that must be disinfected by other means.

(1) Disinfection of clothing by boiling :

This is suitable for all bleached cottons, bed linen and personal garments. Handkerchiefs should be steeped in disinfectants in water, washed separately and then boiled with other clothing from the infected person.

Method : Clothing must be steeped for 12 hours. Solutions that can be used for steeping are :—

Carbolic Acid	1 tablespoonful to 1 quart
Lysol	1 tablespoonful to 3 quarts
Izal	1 tablespoonful to 1 gallon
Dettol	1 tablespoonful to 1 quart.

Wash. Put into the boiler in softened soapy water, and boil for one hour.

Rinse very thoroughly, dry out of doors in the sun.

(2) Disinfection of clothing that cannot be boiled :

Such clothing may be disinfected at the same time as the sick room by fumigating with some special compound that gives out a disinfecting gas, or by spraying with the following solutions :—

(1) by spraying with the solution of 1 tablespoonful of formalin in a pint of warm water,

(2) by pouring half a pint of formalin over 5 oz. of potassium permanganate in a metal dish and leaving it surrounded by the clothing in a closed room for 5 to 6 hours.

Reference Book :

Fundamentals
of
Textiles and their Care
by
Susheela Dantyagi
Head of the Textlies Laundary Work Department
Lady Irwin College.

Publishers :
The Indian Women Writers Cooperative Publishing Society.
Kagal Nagrik Kendra,
S-2 Sunder Nagar.
NEW DELHI.

CHAPTER XI

THE MOTHER-TONGUE

1. Its Importance.

Language—specially mother-tongue—is the most effective medium of expression. We understand others by written or spoken words—which is another name for language. Language and ideas are interlinked—one is not possible without the other. No idea can be expressed without language ; no language can prosper without ideas.

This can be said of all languages. But with the mother-tongue, it is doubly true, because this is the language, in which a man is born—and **reared.**

In school, the importance of language increases. It is not a subject alone; it is the medium through which all other subjects are taught and learnt.

2. Aims of Teaching the Mother-Tongue in Basic Schools.

Basic education is life-centred. In a Basic school only those activities are to be promoted that can help a person to fulfil the needs of life. Only that knowledge is to be given which can be useful in day-to-day life. Bearing this point in mind, the objectives of teaching the mother-tongue in Basic schools should be as follows :—

(1) Development of the power of self-expression, written and oral.

(2) Development of the habit of reading for knowledge and enjoyment.

(3) Practice in the oral and written expression of ideas on social themes.

(4) Practice in clear expression, oral and written, of objective incidents and things.

(5) Practice, oral and written, in expression of details of an activity on completion.

(6) Development of skill in the use of dictionaries and other reference books.

(7) Practice in reporting speeches.

(8) Practice in writing a critical comment on the material read.

(9) Practice in writing essays, giving one's own original ideas on a given subject after consulting references on that subject.

(10) Practice in personal and business correspondence.

(11) Knowledge and appreciation of the literature of one's mother-tongue.

3 Basis of Teaching the Mother-Tongue

In Basic education, the basis of teaching a subject is on activity which fulfils only the needs of life. This is true in the teaching of the mother-tongue also. Students choose a field of activity which fulfils their own need, or that of the society they live in. They lay down plans, collect the necessary materials, examine the data collected, and make use of their own experiences about the subject. Similarly, children follow the customs of the society they belong to, celebrate their festivals, perform prayers, take part in marriage ceremonies, attend meetings and social gatherings. In all these activities, children make their own contributions. Their help takes varied shapes and they have new experiences and gain new knowledge.

The Basic school teacher should see to it that his students study the relevant material on the subject concerned and organise their experiences in a useful manner.

Besides the above social activities, students should also study nature. To a boy, the bright moon in the sky and the twittering birds in the courtyard have a fairy-like fascination. The gathering rain-clouds in the sky send the children dancing through their homes, in pouring rain they love to have a bath, and in winter they enjoy the warmth of the morning sun. Every phenomenon of nature has similarly a definite effect on their minds. It is natural that children should wish to express their feelings, emotions and experiences about these things. A teacher should help the children to improve their language and teach them how to use it.

The basis of teaching the mother-tongue is not the textbooks prescribed by the authorities, but the activities and experiences of the children indicated above. If the sun shines brightly and in the classroom the lesson describes lightning and rain, education loses contact with living experience and hence remains ineffective. When, however, education is linked to the life of the student, the knowledge thus acquired becomes a part of his life and he can make practical use of it.

A few such activities and experiences which may be used to teach the mother-tongue are given below :—

A. *Craft Work*

(i) Spinning and weaving (from growing cotton to finished cloth).

(ii) Agriculture and gardening—growing cereals, fruits, vegetables etc.

(iii) Wood-work and metal-work.

Planning :—At the planning stage, the teacher should guide the children to discuss the why and the how of the activity to be performed. In the discussion that ensues to finalise the plan, the teacher must bear in mind the capabilities and interests of individual pupils. The students should be encouraged to speak their minds without fear or hesitation so that they may develop their power of self-expression. The teacher should use a language which can easily be understood by the pupils. The teacher should also see to it that the language the children use is correct.

After the discussion is over, the plan should be written down by the pupils and corrected by the teacher, thus developing the creative powers of the pupils.

Gathering of Material—The pupils should be asked to express their ideas as to the number and quantity of each material needed for their activity, thus developing their power of expression and making them aware of correct pronunciation. Lists of materials and addresses of dealers should be compiled, so that they may have practice in writing both the previously known and the new words correctly.

Completion of Work—When the pupils do a certain thing under the guidance of their teacher, a variety of questions about the work crops up in their minds. The pupils should either bear their queries in mind or put them down on paper for discussion.

Evaluation and Gathering of Experiences—As the work draws to an end, or even earlier, an evaluation of the work done should be made occasionally, so that advantage may be taken of the mistakes detected and experiences gained. This will not only develop habits of methodical procedure and self-criticism but also of systematic thinking and accurate expression.

B. Social Activities.

(i) *Human Behaviour*—The pupils should know how to behave with parents, relatives, neighbours, teachers, classmates. They should also know and confirm to the basic rules of good citizenship.

(ii) *Cleanliness* (personal and group)—The care of the student's own body, cleanliness of his home, his street, his school and his village.

(iii) *Social Functions*—Organisation of such functions as birth, marriage, death ceremonies etc. Functions and meetings of social, religious. economic, national, international and seasonal significance.

In these social activities, a creative use of the mother-tongue can be made as in the case of craft activities.

C. Nature Study.

Recognition of birds seen in the courtyard or around the house. Recognition of insects in the land around. A knowledge of the sun, the moon, the stars, clouds, lightning, rainbow ; effects of climate on man, animal and the vegetable world. Visits to forests, gardens, rivers, falls, mountains etc.

Nature Study arouses curiosity in man. When a child notices changes in Nature, he asks innumerable questions. A good teacher can exploit such a situation to initiate the child into the realm of literature which relates to it. The teacher should also encourage the pupils to write literary composition.

4. Aids to the Study of the Mother-Tongue.

There are certain aids which may be made use of to make teaching and learning easier and more effective. Chief among these aids are exercise-

books, periodicals, books, pictures, charts, etc. It is necessary that the teacher should know the right use of these aids.

Exercise-books—As soon as the child has learnt to write, he should begin to keep a dairy. The sentences in this dairy should be composed of not more than two to three words each. At the beginning, the dairy may be written with the help of the teacher, but slowly, the task should devolve on the pupil himself. The teacher should correct this dairy every day. Besides the dairy, there should be other exercise-books dealing with different aspects of the mother-tongue.

Books—There is a general misunderstanding about the use of books in Basic education. Some have the wrong idea that there is no need for books in this system. This is far from true. There is need for more books in Basic education than in the traditional systems. In ordinary schools, only those books are studied which are prescribed as textbooks and there is neither the encouragement nor the need to study any other books.

In Basic education, knowledge is expanded on the basis of felt needs in pursuing creative activities. In any particular field of activity, the teacher has first to acquire knowledge that is necessary and then has to help the student to acquire that knowledge when an appropriate situation arises. This means that the teacher should read widely. The teacher gathers knowledge from books and suggests suitable books to the students, according to their varied abilities and urges on them to acquire knowledge for themselves. The student's self-study needs ample guidance and proper direction.

Newspapers and periodicals.—An interest in reading newspapers and periodicals must be cultivated in the students. In Basic schools, the reading of newspapers has proved of immense value in acquiring language skills. Children love to read periodicals. The variety of contents, stories, poems, and anecdotes etc. helps them to improve their knowledge of the language.

Pictures—For clarity of ideas, pictures are helpful. They can be used to introduce alphabets to the child. Stories can be told in pictures. Pictures can be used for exercises in composition, both oral and written

Charts—These can be of different kinds. They may depict language games, daily routines, rules of grammar and so on in a short time charts can help to develop certain language skills in the child.

Teachers of the Mother-tongue—The teachers of the mother tongue should have the following abilities :

(1) To speak correctly, distinctly and with a proper moderation of voice.

(2) To write correctly and legibly.

(3) To apply general rules of grammar and composition.

(4) To make correct use of phrases, idioms and sayings.

(5) To appreciate the works of writers, poets, dramatists, etc. of his language.

(6) To organise and run literary associations and clubs.

(7) To produce suitable literature for Basic schools.

(8) To appreciate students' literary efforts and correct them sympathetically.

(9) To fathom the mental level of their charges and provide them with proper literary materials—thus fostering a healthy literary taste in them.

6. Teaching of the Mother-Tongue

(*A*) *Speaking*

The first thing that the teacher should do is to make the school conditions as agreeable to the child as possible, so that he may feel quite at home at school and express himself without hesitation. To begin with, the teacher may talk to the child about his parents, his brothers and sisters, his neighbours, his life at home, his favourite games etc. The child will develop self-expression by such conversation and his relationship with the teacher will become more informal and happy. To teach particular words to child, the teacher should use them again and again.

Besides, the teacher may engage the child in conversation about his activities. On admission to a Basic school, a child begins to take part in activities like craft, cleanliness, children's meetings and group,-games. These activities provide good opportunities for conversation. The following points may be noted while conversing with the children :

(1) The conversation should be as informal and natural as possible.

(2) The tone should be attractive and voice pleasant to the children.

(3) The subject-matter should be of interest to the children.

(4) The teacher should not lose sight of his purpose while talking.

(5) The child should be made to feel as if he is talking to a friend of his own age.

(6) Mistakes committed by a child during the talk should be corrected, but care should be taken to see that this should not create in him a sense of diffidence and hesitation.

(7) Corrections should be suggested by example. The particular words spoken wrongly by the child may be repeated correctly, and pointedly (with emphasis) so that the child may note the correct form.

When the teacher and the child have become familiar with each other the teacher should, by stages, introduce oral composition as a necessary part of teaching the mother-tongue.

In oral composition, care should be taken to see that only those subjects which relate to their actual life are given to the children to

speak on. The basis of talk and other oral composition should be what the children see, hear and do. Subjects, of course, may be varied to give a fillip to their imagination.

The knowledge that is imparted to the children in their mother-tongue should be such that a progressive increase in their vocabulary is ensured. For reproduction on certain occasions, e.g. Balsabha, celebrations of festivals etc. they may be asked to learn a few lines of poetry, or dialogues by heart.

(B) Reading

Before the child is taught to write, he should be taught to read. There are various methods of teaching reading. But we shall discuss only those methods which can conveniently be used in the Basic school.

The word and Sentence Method

Basic teaching is based on productive activity which is connected with children's lives in some way In every form of activity, children use some materials. The names of these materials are learnt by children by hearing them spoken. By seeing their written form again and again, they learn to recognise them without much difficulty. The teacher should take advantage of this. The name of each thing used should be written on the blackboard and the children should be made familiar with them. For exercise, the names of four or five things may be written on the blackboard and the children made to place the things they represent opposite these written words. Two types of cards may be made—one type will have the names of things on them, and the other will have pictures of things. Let children recognise the related cards– thus learning to recognise words.

Children have a keen desire to recognise their written names. On one side of the blackboard the names of all the children of the class may be written. The teacher may then read them out several times. Now, if a particular name is indicated by the teacher with a pointer, and the child of that name is asked to stand up, this will be an interesting game. Every child will be made to stand up by turn. There may be a few mistakes at the beginning but they will learn after a few repetitions. The children thus will not only recognise their own names, but also those of their classmates.

When the children are familiar with the names of their classmates and things, new words may be introduced using those letters and affixes which have already been taught. These new words should also be written on the blackboard. In a few days, the children will become familiar with these words also.

The activities in which children participate during the day should be described in three-word sentences on the blackboard. Not more than two to three sentences should be written at the beginning. By steps, the activities of the children will go on increasing and so will their reading abilities.

Along with this method, use may be made of pictures, charts and the like according to the need and the material available. Important events in the school can be described in three-word sentences on the bulletin board. Emulating elder students children of the first grade will try to read the items written on their bulletin board.

Similarly a story can be told in a few sentences with the help of a series of, say, three or four pictures. The showing of pictures should be followed by reading, thus stimulating interest in reading in the children.

After this stage is reached, children should be given small books which have their daily activities described in simple prose and poetry. The standard of these books may be gradually raised. At the beginning the teacher may read aloud and ask the children to read, giving special attention to correct pronunciation. Later on, they may be taught to read silently.

The teacher should bear the following points in mind in regard to reading :—

(i) Words should be pronounced correctly and distinctly.

(ii) There should be a suitable pause between and at the end of sentences.

(iii) Stress should vary with the emotion described.

(iv) Speed in reading should be neither very slow nor very fast.

(v) Pitch of voice should be neither high nor low.

(vi) Correct posture should be insisted upon. The body should ordinarily be kept erect without unnecessary movement.

(vii) While reading aloud, the eyes should not be fixed on the book all the time. A glance may now and then be directed towards the audience.

(viii) The book should be kept about a foot away from the eyes.

(ix) The book should be held in the left hand making an angle of 130°

These rules should be carefully followed in the early stages, so that they may be observed effortlessly later on.

(c) Writing

Formerly, the method of teaching writing was to initiate writing with the alphabet. Then followed the learning of writing affixes, then words and last of all, sentences.

In Basic schools, the teaching of writing is based upon the interests and needs of the pupil. The child likes to write his name and the details of his work. Writing should, therefore, begin with the child's own name, the names of the materials used and the activities performed in the class. All the children of the class clean the classroom. They wind the yarn they have spun on the winder. These winders all look alike, so that it is

difficult to tell them apart. The children have now learnt to read their names, which may be written on the blackboard. Pieces of paper may be given to the children to write their names on these papers and fix them to their winders with thread. This writing may be wrong in the first few efforts, but the teacher should carefully make the corrections. When everyone has obtained sufficient practice in writing his name, let the children write their classmates' names. The children may also write the names of things which are used in other class-activities. Then should come the writing of small sentences connected with these activities. As they have already learnt to read, writing will not be difficult. The teacher should write a few small sentences on the blackboard, which the students copy in their exercise-books. This will be the beginning of their daily routine. By and by this routine will widen its scope—and the children will be told to write about their days' activities in greater detail. The children should be made to write about any festivals that may be celebrated in the school premises. This description may be short, but, what is important is, that they write it entirely on their own.

We have so far dealt with the subject-matter about which children should write. Now let us turn our attention to the question, how should they write ? In order to write a good hand, the following points should be kept in mind:—

(a) Posture—Sitting with a straight back, keeping the book at a distance of at least one foot from the eyes.

(b) The Correct method of holding the pen—It is important how you hold your pen. The pen should be held at a place neither too close nor too far from the writing point. An inch above the point, the pen should be held between the thumb, and the first and the second fingers.

(c) Proper spacing—Even spacing is needed between letters, words and lines—so that the writing may not only look beautiful but also be easy to read. The space of one letter between two words and the space of one line between two lines should be left blank.

(d) Well-formed letters—Every letter should be written complete, without abbreviations. Up-right lettering should be preferred to slant writing.

(e) Margin—Equal margin should be left on the paper—top, bottom, right and left.

(f) Only after children have learnt to write well and correctly, should their attention be drawn to the problem of margin and of punctuation.

(d) Composition

The aims of teaching composition are as follows:—

(a) To make the child efficient in writing correct, simple, idiomatic language.

(b) To increase the effective vocabulary of the child.

(c) To develop the ability to organise ideas and express them systematically.

(d) To make him efficient in collecting materials on a given theme from different sources.

(e) To develop the imagination.

(f) To increase the power of self-expression.

In Basic schools, the subjects of composition are those connected with the child's daily life. The following subjects may be mentioned in this regard:—

(1) Diary of daily events.

(2) Plan of work.

(3) Details of activities.

(4) Evaluation of work and experience.

(5) Letter-writing--personal and business.

(6) Applying for a post and issuing invitations.

(7) Essay for the children's meeting.

(8) Writing for the school magazine.

(9) Announcements and notices for the school bulletin board.

(10) Description of meetings organised in the school.

(11) Report on travels organised by school authorities.

(12) Descriptions of flowers, shrubs and vegetables grown in the school garden.

(13) Essays and other composition for contemporary periodicals.

(14) Stories, articles and poems for the lower classes.

Diary—Of all the aspects of teaching composition in the Basic school, diary is the most important. No sooner do children learn to write, then they are asked to keep a regular diary. They are expected to follow this habit all their lives. To initiate diary writing the teacher should talk to children and write a few sentences about the work done during the day on the blackboard. The sentences on the blackboard should be short, simple and unambiguous. The children should be asked to read these sentences to begin with. After a few days, they should start copying them down in their exercise books. From class III onwards, the children should keep their own diaries. On the basis of the work done during the day, the teacher should ask them questions eliciting the information needed for the diary. In classes III and IV, these questions should be written on the blackboard and the children should be asked to answer them orally. Later, they should be asked to write down the answers. From class V to VIII the students should be able to write diaries of their own. Besides detailing the day's work, the students should be stimulated to express their opinions about them. The teacher should correct the diaries of students, for, without necessary corrections and suggestions, there is little chance of improvement.

The teacher should serve only as a guide. Actual writing is of course to be done by the students themselves. About the planning of activities there should be a general discussion in the class. The description of events and experiences would naturally be the students' own affair. The teacher should only give a few hints about the points that may be covered.

Letter writing—Letters, both personal and business, have an important and useful place.

The teacher should explain the form of these two kinds of letters, and ask the students to write letters when the occasion arises. The students may write personal letters to relatives and friends when needed and business letters when dealing with people in connection with the purchase of materials for the class or for selling manufactured goods in the market. Similarly, occasions should be found for the children so that they may write letters to officials, letters applying for a job, letters inviting people to meetings and so on. The forms of these letters should be presented and explained to the students at the right time.

In every Basic school, a meeting of the children's club is a permanent feature of the regular programme. In these meetings, a variety of activities is represented. Debates, story-telling, reciting of poetry, music, anecdotes, devotional songs and essay-reading are the main items in the programme. Every teacher should encourage his students to write essays on topics related to their social and physical environment keeping in view their stage of mental development. The topic which the students choose should be discussed at length in the class. Thereafter, students of Class V and below should be given points that may be developed in the essay, and students of Class VI and above should be left free to write the essay after the discussion. The best essay, after having been corrected by the teacher, should be sent to the weekly wall paper. Compositions for the school magazine should also be chosen similarly.

In running a Basic school, the principle of student self-government is implemented. Most of the work in this connection is done by the students themselves under the direction of the teachers. There is a board of student representative for this purpose. Everyone on this board has one particular responsibility. The members submit their reports every month to the school assembly. The teacher should see, if any student of his class is a member of this board, that his report is worded correctly. He should devote some time to guide the student and only the corrected report should be sent for reading in the school assembly.

The children should write descriptions of celebrations by the school and conducted tours. These too should be preceded be a talk with the teacher and followed by his corrections in the composition. An interesting item is the writing of descriptions of the flora and fauna found in the school garden and of things made in the classroom. In the lower classes, a few specimens of such descriptions should be placed before the children as models for them to follow. Children in the higher classes should be given a subject and left to write the essay on their own.

Talented students of the higher classes should write essays and other compositions for general periodicals. The teacher may correct their compositions for submission to magazines and periodicals. This will not only

help to develop their creative ability, but also create self-confidence in them. Students of classes VII and VIII may also write stories, essays and poems for use in the lower classes.

All these activities will bring to fruition the creative talents of the children. To accomplish this work in the best way, however, the following points may be borne in mind by the teacher:—

(1) Composition should be assigned to students in accordance with their abilities, and inclinations.

(2) Students should be trained to observe things carefully and with an open mind. They should practise describing what they see and understand with as much objectivity as possible.

(3) Before the children begin to write, they should have acquired the necessary knowledge on the subject. Talks with the teacher, study of books on the subject concerned, examination of prevalent conditions—these are some of the means of acquiring such knowledge.

(4) The atmosphere in the class should be such as can encourage children openly to express themselves. Specimen compositions should be placed before the students and a discussion should always precede the actual writing. This will make composition work easier and more natural for the children.

(E) Story-telling and story-writing.

Children love stories most. Let some one start telling a tale and they will leave everything else to listen to it. They love to hear stories of cats and dogs, of frogs and mice. Toys lose their fascination with age, but interest in the story remains.

This is an established truth that stories interest all. But this also is true that all stories do not interest all people. One kind of story may interest one person, but it may be very uninteresting to another person.

The teacher should bear these facts in mind. A study of child psychology may help him to determine the kind of story, its length, subject-matter, style and language suited to the children concerned. The children in Basic schools are from the outset educated in the realities of life, that only those stories can interest them that are based on real life and the realities of life. Therefore only those stories which are directly connected with the children's social and physical environment should be selected. For the development of imagination, of course, a few imaginative stories may also be chosen.

The following points may be borne in mind by the teacher while choosing and writing stories for Basic school students as regards their subject matter and style:—

(1) The story should extol one of the following qualities; self-help, truth, non-violence, benevolence, courage, love, devotion, sacrifice, forbearance,etc.

(2) The contents of the story should be such that the children are familiar with it or they can easily imagine it.

(3) Stories should be able to touch the imagination of children. Pure realism which is only a description of incidents will not do.

(4) Stories written for small children can have animals as characters. Children take special interest in animal stories. The actions attributed to animals should be of the same nature as those that can be performed by children themselves.

A teacher telling a story in the class should see to it that:

(1) his language is simple, clear and correct,

(2) his voice reaches every student in the classroom,

(3) his tone fluctuates (The same tone throughout, without any rise or fall would be monotonous.

(4) his gestures are appropriate to the emotions depicted in the story. (Too many gestures and too much acting, of course, are to be avoided).

(5) The story is not too long-or else the teller may be tired before the story is finished.

(6) The reaction of children to the story should be continually noted and the modifications made in the story for future telling.

Children love not only to hear stories but also to tell them themselves. If the teacher provides his pupils with opportunities to tell stories, it will help them not only to develop their power of expression and to widen their vocabulary, but also to make their imagination richer. In making children tell a story, the following points may be observed :

(1) The teacher should tell a story to the class and then ask the children to relate in their own words. One child may be allowed to tell the complete story, or a number of children (one after the other) may take it in turn to tell.

(2) The teacher should tell a story and then ask the children to tell another story of a similar nature. This will help to develop their imagination.

(3) The children should be asked to tell stories given in pictures in their own words.

(4) The teacher should tell a major portion of a story and let the children guess the end. The children should not be hurried, and a constant check should be kept to see that they do not take a wrong course in the story. Helpful suggestions may be offered wherever needed.

(5) Another method is to write down the beginning and the end of a story on the blackboard, and let the children fill in the blank. This blank should be short in the early stages and gradually grow longer.

(6) In the higher classes the children may be told only the end, so that they may exercise their imagination and complete the story.

(7) A story may sometimes be invented in play. The teacher tells the first sentence of the story. Then every student takes his turn to say a sentence, developing the story as they go on. At the beginning, such a story may be a conglommeration of sentences, ideas and incidents, but a little practice will result in good stories later on.

(8) The main incidents of a story should be put down on the blackboard. The students will first complete the story orally, and then put it down in writing. The teacher will then make the necessary corrections.

(9) A few words and phases appropriate for a particular story may be told to the students and written down on the blackboard. The children should then compose a story. The teacher will correct it.

How to tell a long story

Children should be told very short stories to begin with. But sometimes on a special occasion, it is necessary to tell a long story. In such a case, the following procedure may be adopted :

(1) The story should be divided into several small parts.

(2) After telling each part, the students should be asked to repeat it from memory. Only when it is evident that all the students are familiar with the first part, should the teacher tell the second part of the story.

(3) When the third part has been reached, the students may be asked to repeat the first two parts together.

(4) When the story is complete, that should be told again from the beginning to the end. One student may tell the first part, another the second part and so on.

(5) The students should be left free to draw the moral of a story, if any, for themselves. The moral should never be made directly clear, or else its purpose is defeated.

(6) The students should then be told to write the complete story. Mistakes in grammar, style and description should be corrected.

(7) Stories should also be dramatised in the class sometimes.

Collection and publication of original short stories :

When a student writes about things he has seen and heard, his compositions have a personal impress upon them. In a similar way, a story written by a student reflects his personal experiences. The teacher should prepare a collection of stories written by students and encourage them by getting their stories published in the school magazine. Stories of exceptional merit may also be submitted to literary magazines of local or national repute.

(F) Play and Dramatisation.

Dramatisation is a natural thing with children. Knowingly or unknowingly they have to imitate others. See any group of children, and you will find them acting. One is impersonating a king, another a thief, a third plays a money lender and a fourth a hermit, and so on.

Therefore, education that is imparted to them through acting will be full of joy. The teacher of the mother-tongue should, whenever possible, use this medium of education.

Many occasions for acting arise in a Basic school. A children's meeting takes place every week. In that, acting may be given a pride of place. The teacher should select suitable plays and dialogues to suit various occasions. The students should also help in this choice as well as in the choice of the Cast. The members of the Cast should write down their dialogues and learn them by heart. It is advisable to let the Cast perform a full-dress rehearsal before the play is finally staged at the weekly meeting. It is important to make sure that spontaneity in expression is not crushed by undue insistence on following a rigid pattern of performance.

The children will be found to take much interest in this work. They will readily remember long dialogues although they may not be able to memorise other materials. Thus their knowledge of vocabulary will increase and the beautiful phrases and idioms, and apt verses thus learnt will create a basis for creative writing later on.

Suitable stories can be read for dramatisation. Care should be taken to see that the students understand the spirit of the story, as well as remember the chronological order of incidents. Then the interest of the children should be aroused to act the story in the class. The Cast should then be chosen with the co-operation of the students themselves and the names of the proposed participants written down on the blackboard.

Enough time should then be allowed to the members of the Cast to prepare the dialogues. A temporal sequence of events in the story should be fixed well in their minds, and only then should the play be performed in the classroom.

This will develop the power of self-expression of the students as well as widen their imagination. The teacher should see that an opportunity for participating in a play is afforded to every student by turn.

In the course of acting, the teacher should look on as a member of the audience noting all the flaws he may find in dramatisation for discussion in class later on. Interruptions by the teacher during the play will only damp the children's enthusiasm and so should be avoided.

Events occurring in the nationaland international spheres can be adapted for dramatisation. Events thus enacted before children have a profound effect upon them and not merely widen their knowledge of the language, but also rouse their interests and sympathies.

Children in the Basic school take part in activities that may help to make them self-sufficient with regard to shelter, food and clothing. These acti-

vities can easily be put into the form of stories, real and imaginative, for the purpose of dramatisation. Thus a story could be told about a spinner, a weaver, a carpenter, or a peasant—and then acted out in the classroom.

On festivals, anniversaries and days of national importance, dramas should be enacted on related subjects. Children should be encouraged to write small plays on such themes. Seeing their own creations staged will fill them with pride and happiness.

(G) POETRY.

In the training and development of the emotions in a man's life, poetry plays an important part. But this happens only when the reader goes deep into the ideas and emotions expressed in a poem. The purpose of teaching poetry is not therefore limited to teaching the meaning of words but to making the students appreciate the idea behind the words.

Many natural opportunities present themselves to the Basic school teacher to arouse in the children an interest in poetry. The children take part in prayers every morning and prayers are mostly in verse. Similarly, children recite poems in weekly meetings according to their tastes. A clever teacher notes down suitable poems for use in different classes, asks children to bring their favourite poems to him, so that he can explain them to the class in a proper way. Festivals, religious and cultural celebrations, birth anniversaries of great men or women are a few of accasions when children gather poems and learn them with pleasure.

It is necessary that the teacher should exercise the utmost care in the selection of these poems. Ordinary Primary schools have textbooks with a few poems in each. The teacher's work is limited to explaining them to students. But in the Basic school, the teacher himself has to choose poems appropriate to the occasion or to get poems chosen by students for themselves. The following points should be borne in mind while choosing poems:—

(1) Poems should be easy to memorise.

(2) They should be suited to the mental level of the students.

(3) They should touch the children.

(4) They should be associated with some class activity.

(5) The subject matter should be within the limit of the students' world of experience.

(6) The poem should be small and the words and ideas unambiguous.

(7) The poem should evoke beautiful and noble ideas in them.

(8) Even some difficult poems can be chosen, sometimes on appropriate occasions, if they can be easily memorised. Children can enjoy a readable poem even without understanding its meaning perfectly.

After the choice has been made, the question of its presentation arises, The children take part in various activities connected with the needs of everyday life. In the performance of these activities, they need to know about different aspects of life. With the teacher's help they gather the

information required, but to make this information endure, it is necessary to present it in a form that is easy to read. poetry is such a form. For instance, poems on seasons come in very handy when children desire to know the characteristics and effects of seasons. The Basic teacher may similarly present to his class poems on nature. To create enthusiasm in students for work, the teacher may read out poems to the class glorifying manual labour. These poems may be explained at length later on in the class. Only those poems should be introduced that are connected with the children's activities, their social life, or their natural environment. A poem should never be forced on children, but should be taught them only when they are ready and eager to receive it.

When a poem conforming to the students' taste, need and atmosphere has been chosen, the process of teaching starts. Poetic atmosphere is needed to teach poetry. Reading a poem with the right tone and inflexion moves the reader as well as the audience. The children are thus stimulated to learn the meaning and the spirit of the poem.

The teacher should, therefore, pay attention to pronunciation, pause, and voice inflexion and thus read the poem as poems should be read. Then a few or all the students of the class should be asked to recite it. Care should be taken to see that students with an unpleasant voice are never asked to recite, and if the teacher himself has a harsh or shrill voice, he should ask a sweet-voiced student to read the poem aloud.

In order that the children may enjoy the reading of poetry, this should be made a regular feature of religious and seasonal festivals. Stories in verse can also be presented on appropriate occasions.

The vocabulary of students of class III to V is not very wide. Therefore while teaching them poetry, special attention should be given to difficult words and their meanings. But the meanings should not be told directly. The teacher should ask questions connected with the difficult word, or that word should be used in several sentences so as to make its meaning clear to the students. Reading a poem aloud and telling the meanings of its difficult words, will help students to appreciate its contents, but to make it crystal clear, each line should be explained by means of various questions. In the formulation of these questions, the teacher should exercise special care so that the students' aesthetic sense and imaginative power are developed.

Poems meant for classes VI to VIII should be a little deeper in meaning. It is, therefore, necessary to ask more detailed questions in these classes. Attention should be drawn to the beauties of the poem in question and idioms, similes and metaphors should be explained in detail. The extent to which the students are able to grasp the meaning, should be ascertained by means of questions. Finally, a few questions should be framed on the basis of the complete poem, so that their answers may completely fathom the ideas underlying the poem. In classes VII and VIII, children should also be familiarised with metre.

Before a poem is finally put away after study in the class, it should be ascertained by means of questions whether the students have really jot to the heart of the poem. Till the teacher is sure on this point, he should not

proceed further. The students should be asked to use new words and idioms in various sentences so that they become completely familiar with them.

Poetry reading competitions, filling up last words or lines of verses and poets' get-together should also be arranged occasionally to foster taste for Poetry in the students.

(H) PROSE.

Poetry is the expression of man's tender feelings. But prose comes in handy for our daily use. In the discharge of our duties, we have to communicate with a number of persons and all this is done in prose.

Bearing the importance of prose in mind, we may note the following objectives as regards teaching prose in Basic schools :—

(1) Ability to understand written prose and to explain it in one's own words.

(2) Addition to the students' vocabulary.

(3) Knowledge of different styles of prose.

(4) Ability to enjoy the beauties of language and ideas.

(5) Increase in taste for deeper study

(6) Development of imagination.

(7) Ability to use various styles in one's own writings.

Basic schools use three aids to fulfil the above requirements :—

(1) Newspaper and periodicals—Students study these on their own or with the help of the teacher.

(2) Well-written books on various subjects—selected parts from these may be taught at the appropriate times.

(3) The books about class activities—These are chosen for special study only.

Newspapers and periodicals inform their readers about topical happenings. They also help one to know something about the language and its literature and about national and international developments. Keeping the intellectual level of his class in view, the teacher may choose a few periodicals for study. They may be studied by all the students by turn. The important portions needing the attention of the class may be read out to the whole class. The students may also collect important news items of national and international interest.

In the syllabus of the class, those books that deal with useful subjects written in a forceful style should be included.

Guided study has an important place in the Basic system. The object of the teacher is not to teach the prescribed textbook in the mother tongue but to instil in the students a desire and taste for study. This object can be

fulfilled only when the students are encouraged to study on their own from time to time.

For example, when arrangements are afoot to celebrate Independence Day in school, the teacher should give the students books and periodicals dealing with this topic. A few questions based on the book may be given to be answered by students after they have studied the book. The teacher should then correct the answers and if need be, he should help the students to understand the subject more thoroughly.

(I) GRAMMAR

There should be no place for grammar as a separate subject in Basic schools. In the course of oral and written self-expression when there is a grammatical error, the children should be told the rule to rectify the error and to help them learn the correct usage. This should not be taught through books on grammar, but should incidentally as and when needed. For instance, recognition of gender, number, person, subject and simple rules of composition can be brought home to students when correcting their exercises. Sometimes, when a number of students have made the same kind of mistake, the attention of the whole class should be drawn to it, and the correct form explained at length. The children should help the teacher in this process.

Consequently no separate time should be allotted to the teaching of grammar in the class. In Basic schools, the knowledge of grammar imparted should be such as to enable them to speak and write correctly. This knowledge can be given by the teacher at any time during the course of school activity. The teacher should repeat correctly a sentence spoken wrongly by a student, drawing the student's attention to the mistake and asking him to repeat the correct form. Thus a foundation will be laid for correct usage. In a short time with the concerted effort of the teacher and the students, the latter will learn to apply the rules of grammar for correct expression.

(J) CORRECTION WORK IN THE MOTHER-TONGUE.

In the chapter dealing with composition, mention has been made about correction, which is an integral part of any kind of education. Unless correct-ted in the early stages of learning, reading and writing, the mistakes of the the students may be carried over to adulthood. Therefore, as soon as the the child begins to speak, his language should be corrected. It should be done with tact and understanding so that he may not feel diffident about having made the mistake. As we have already stated, the best method of correction is to repeat the child's wrong sentence correctly. Careful attention should be paid to the pronunciation of words because mistakes here lead mistakes in speaking and in written composition.

Of all mistakes in composition, those relating to spelling are most common. To obviate these, attention should be paid to the following—

(1) To form and strengthen the correct impressing of a word in the student's minds, they should be taught to observe it correctly. Their eyes should be so practised that they can discern the correctness of a word at a glance.

(2) In the early stages, the students should get the spellings of words by heart and tell them aloud. With this kind of coordination between

the ear, eyes, and tongue, the character of a particular word is more firmly fixed up in memory.

(3) If a page or two of a book are copied daily, the mistakes in spelling will be minimised. The act of copying requires a coordination of the eye, the mind and the hand. Copying work can be continued up to Class VIII, the standard of the copied matter raised progressively.

(4) Taking dictation also helps in this regard as one knows thereby which words are not properly remembered. The words wrongly written should be repeatedly written in their correct forms a number of times. The teacher must make correction himself or underline misspelt words, and ask the students to correct these themselves. Dictation should be corrected by the teacher at the beginning, but for class IV and above, the students should correct each other's exercise books under the supervision of the teacher. The teacher must see to it that the students write the correct form of the misspelt words at least five times.

(5) Various word-making games in the class can prove very useful in the improvement of spelling.

(6) The teacher can lighten his work by teaching the students the use of the dictionary.

Besides spelling mistakes, students commit grammatical and compositional errors. Idioms and words are wrongly used. The teacher should observe the following rules in regard to correcting the mistakes of students.

(1) As far as possible, the correction should be done in the presence of the student concerned.

(2) The word misspelt by most of the students may be taught in its correct form to the class as a whole, and everyone should be asked to write it down.

(3) The students whose mistakes are corrected should know why a particular word or its use is wrong and what is the correct form.

(4) It is better to correct at few exercises thoroughly than to correct all the exercises partially.

(5) The mistakes may be underlined and left for the students to correct. The teacher should, however, check them after correction. Up to class III, the correct form should be written completely. In classes IV, V and VI only difficult and misspelt words should be given correctly. For the remaining mistakes, abbreviated indication should be given as to the nature of the mistake. Mistakes in speaking should be marked "S", mistakes of grammar marked "G" and so on. In classes VII and VIII these indications should be dispensed with. Here the mistakes should only be underlined and students asked to correct them on their own. In every case, however, the teacher should assure himself that the students have made the required corrections.

(6) Sometimes the teacher takes too long to correct the written work of the students. This makes them lose interest in the work. It is, therefore,

necessary that the exercise books should be returned to the students as soon as possible.

(7) The teacher should sometimes ask his students to read out their composition in the class for group criticism. This should be done by rotation so that each student may derive the benefit of his classmastes' criticism.

(8) When correcting composition, suggestions should be made for its improvements as regards idea, language and style. Also, marks or grades should be given for each piece of composition, so that the student may know the standard he has reached.

(9) If there are too many errors in composition, the student should be asked to write it again.

(10) Students of higher classes should correct each other's exercise-books under the supervision of the teacher. This will create self-confidence in the students and they will easily recogn'se errors and avoid them.

8. Planning of Education in the Mother tongue

Pre-planning is needed to carry any activity to a successful conclusion. The number of children in a class, their mental level, the quality and quantity of reading laid down for them in the curriculum, their capacity to absorb knowledge, time available for a particular subject during the year, the items of craft and other activities to be undertaken by the students themselves, all these and many other points may be borne in mind when laying down the yearly programme of students in the mother-tongue. The programme should also state the activities that the students will undertake as regards agriculture, cloth-production, leather-work etc. and what studies they will need for the purpose. Similarly, when mention is made of festivals and celebrations, etc. the kind of books to be studied on different occasions may be suggested. In short at the beginning of the year itself, the students as well as the teacher should know the books they should read and the topics that they should choose in the study of the mother-tongue.

Once the programme is finalised, it may be divided into two parts. It should be well understood that half the work is to be finished in six months. Problems are even then likely to arise as regards the choice of subjects and priorities. For this a monthly programme may be needed. In the monthly programme, attention may be given to festivals and special days during the month and studies and writings may be confined to subjects relating to these days. Care should be taken to see that these monthly programmes are finished in time and the total programme for six months is completed within the period. If the monthly programme is finished before the end of the month, the curriculum may be extended to take advantage of the time available. Similarly, if the monthly schedule is not finished in one full month, the programme may be modified accordingly. It should always be borne in mind that the six-month's schedule is finished in time. At the end of eight months, an appraisal may be made of the work done, vis-a-vis the yearly schedule. If less work has been done, work must be so that the yearly programme may be finished and in time; if the work is far in advance of the schedule, the remaining time may be utilised in going over the subject in which a majority of students are weak.

Laying down a work schedule and examining the progress made by the students from time to time and in making modifications in the future schedules, help in getting the work done well and in time. Thereby the participants in an activity come to realise their own power of work and thus gain self-confidence.

An annual schedule for every class should, therefore, be laid down and a copy of it given to every student. The same course may be adopted as regards half-yearly and monthly schedules.

9. Daily Programme

We have already described what is meant by yearly, half-yearly and monthly schedules. Now we shall discuss the importance of laying down the daily programme. The teacher should never enter his class without a prepared programme for that day. He should, for example, know the activities to be undertaken and the purposeful studies that are to be followed in class during the day. The daily programme is a guide to the teacher throughout his working day and prevents him from digressing. When the day's work is done, the teacher may refer to his programme and adjust the next day's programme accordingly . The daily programme should be framed with the following items in mind :—

1, Date, class, attendance.

2. Work and time schedules.

WORK	TIME
A.—Purposeful Activity (*i*) Craft. (*ii*) Social (*iii*) Nature Study	Time and date should be mentioned against the relevant subject.
B.—Correlated subjects : (*i*) Mother Tongue (*ii*) Arithmetic (*iii*) Social Studies (iv) General Science (v) Art	Time and date should be mentioned against the relevant subject or subjects.

3. Clarification of activities : The purpose is fulfilled by a certain activity, how much of it has been done, how much is expected to be finished on a certain day.

4. Correlated subject : Any subject that is likely to crop up in the course of the day's activities—may be mentioned.

5. Method of Study—Details of work that may be given to the class to fulfil the objectives of the day's work, together with a list of questions to be asked in the class.

6. General evaluation of the experiences of the day.

A few examples of daily programmes are given below :—

(1) Date : 3-12-1952.
Name of School : Patna Basic School.
Class : V
Time : 1 hour 30 minutes.
Teacher : Shri Satyanarayan Lal.
Work and time Schedule.

Purposeful activity : To celebrate the President's birthday, one hour. (To decorate the classroom with pictures, flowers. To prepare garlands, read poem about great men).

Correlated subject : Mother Tongue : 30 minutes.

Definition of Activity

It is the 3rd day of December, the birthday of Dr. Rajendra Prasad, President of the Republic of India. The children planned to celebrate this day with the following programme :

(1) Cleaning the classroom.
(2) Decorating the room with flowers and leaves.
(3) Procuring a table cloth.
(4) Procuring a photograph of the President.
(5) Decorating the table.
(6) Garlanding the photograph.
(7) Reading a poem in praise of the President.
(8) Delivering short speeches on the President's life and work.

Date : 15.7.54.

Place—Basic School, Nanbatpur.
Class—V
Time—2 hours and 40 minutes.

Work and Time Schedule :

1. Purposeful activity—Spinning for a pair of shorts for two hours.
2. Correlated subject—Mother Tongue for 40 minutes.

Definition of Activity:—The twenty students of the class have decided to make a pair of shorts each. At the rate of $1\frac{1}{2}$ square yards for one pair of trousers the total requirement should be 30 square yards of cloth—i.e. 120 *Gundis* of yarn. The students have already spun 90 *Gundis*. Today, they will spin non-stop for two hours. The average of the whole class being 220 maunds of yarn per hour, approximately 12 *gundis* of yarn can be spun during this period.

Correlated Subject : Mother Tongue : During the spinning period the students have been singing a song while playing the spinning wheel. They are now proficient in singing it to a proper tune and with pauses at the right places.

Read the poem and explain it.

Method of Study :

(A) Each student will take his own spinning wheel. The teacher will make a preliminary examination of these wheels to see that they are in proper working order. Spinning will then start. Every half hour, the yarn will be transferred to the winder. Spinning will stop at the appointed time. The students will note down the number of rounds of yarn they have spun. The wheels will then be put away.

(B) To make the meaning of the song clear, the following questions will be asked :—

(*i*) What is the title of the song you have sung while spinning ?

(*ii*) Why is it so called ?

(C) After these questions have been asked, the students, who have got the song by heart, will recite it from memory. Two students will then read it aloud and the rest of the class will listen. To find out how the students have understood the meaning of the song, the following questions will be asked :—

(*i*) Why is *Khadi* described as the "tears of the peoples" ?

(*ii*) What is the special quality of a saint's heart ?

(*iii*) What is special about moonlight in the month of 'chait' ?

(*iv*) State the similarity between *Khadi* and moonlight in *chait* ?

(*v*) How can one cleanse the heart of a sinner ?

(*vi*) In what way can *Khadi* make the future of India ?

(*vii*) When you see the yarn intertwined in a piece of *Khadi* cloth, what emotions does this sight produce ?

(*viii*) Why does the poet praise *Khadi* ?

The answers to these questions will make the idea of the poem clear to the whole class.

(E) The following questions will develop the creative power of the students :—

(*i*) The ordinary person cries in grief. What does he do when happy ?

(*ii*) The moon in *Chait* is bright. How would you describe the dark night of the month of *Bhadon* ?

(*iii*) People who live in India are called Indians. What would you call the people of China ?

(*iv*) *Khadi* is clean as a saint's heart. What about mill-cloth ?

After this, the students should write a summary of the song in their own words, and it should be corrected in class.

CHAPTER III

THE TEACHING OF SOCIAL STUDIES

The main object in the teaching of Social Studies is to quicken the interest of the pupils in the civic, social and political problems around them and to help in the development of healthy attitudes and right habits of thought. The teacher should approach this field of knowledge in such a way that they will realise, in the first place, that these problems exist and they have to be carefully observed and studied so as to collect the necessary data. The students should then have an opportnunity to let their minds play on the problem, to think over it, to see its various aspects and bearings, so far as they are within their mental reach. This will eventually lead them to acquire the requisite knowledge, partly through observation, direct experience and planned activities and partly through the study of books and the teacher's talks and discussions. The cycle will be complete when the students are given the chance to apply the knowledge gained in some appropriate form—practical or expressional—and thus to assimilate it into their mental and emotional attitudes. Many of the general principles of good teaching will, of course, apply to correlated teaching in Basic schools e.g., beginning with the child's immediate environment and the knowledge that he already possesses, linking up new knowledge with relevant experiences, encouraging self-expression in various forms, breaking down the artificial walls between different branches of subject matter, showing the relevance of what the child is learning to his life and interests. It is not necessary to elaborate these well known principles. It would perhaps be more useful to work out how a particular unit in Social Studies can be handled so as to become a *genuinely educative experience* for the student. I shall choose for the purpose of demonstrating what I mean a highly significant and somewhat difficult theme—Democracy—and try to show how it should be introduced to students in the top classes of a Senior Basic or the lower class of a post-Basic or Secondary school. In the following pages, an attempt is made to indicate the various stages and aspects of the selected unit of study—the testing of previous knowledge, the discussion of the significance and bearings of the theme on their life and the widening of their knowledge and mental horizon by frequent references to the problems of the contemporary world. In the note meant for the teachers, illustrative examples have been given of the kind of creative activities, problems and projects that can arise out of the theme and the kind of test that can be given to judge not only factual knowledge but what is even more important—clarity of understanding and development of attitudes.

It is not claimed by any means that this is the only or the best approach to the theme or that it can be applied *pari-passu* to any other theme. There is, however, no doubt that such an approach *does* create mental awakening and intellectual curiosity and bridges the gulf between life and learning. It also knocks down the barriers between the traditionally walled-in subjects of History, Geography, Civics etc. In actual classroom work, it would obviously not be possible to deal with each theme in such

detail but even if a few living and significant themes are handled in this manner during the year, it will give a new meaning and dynamism to school teaching. Sections 1 and 11 deal with the contents and the methods of teaching the proposed unit on Democracy and Section III suggests how this might be worked out as a project arising out of the celebrations of the Independence Day by senior students of a Senior Basic school.

GENERAL STUDY OF THE UNIT ON DEMOCRACY

(Instructions for Teachers)

I

Sub-Unit—1.

The Meaning of Democracy

The first lesson may well be devoted to an Attitudes-and-Opinions Test in order to discover the pupil's conception of, and attitude to, democracy.

The main objective of this test is not to estimate their knowledge but to stimulate their interest in the subject and make them realise its importance as also the fact that their ideas about democracy are necessarily inadequate or defective. Another purpose is to draw their attention to some of the urgent problems which face the emerging democracy in India today.

Some of the questions that may be included in this preliminary test are :

1. What form of Government do you like best ? Why ?
2. What do you understand by the democratic way of Government ? Why is it better than personal rule ?
3. In what way are people equal in a democracy legally, socially, economically ?
4. What are the duties of the citizens in a democracy ?
5. Which type of Government is easier to run, democratic or autocratic ?
6. What is the change that has occurred in the system of Government in the country since 1950 ?

These are not just questions to be answered but a jumping off ground for the discussion of the issues involved. Therefore, the second lesson may well be devoted to a discussion of the answers of the students in which the teacher and the students all take an active part. The discussion should clearly bring out the following points :

(*a*) Students have confused and sometimes contradictory conceptions of democracy. If democracy is to succeed in the country, we must know what it is and what its implications are for all of us.

(*b*) There is need for a more true and comprehensive definition of democracy. It is not merely a question of voting at the time of elections.

At this stage, the teacher can make a reference in a suitable manner to the fact that international crises have often come about because of the incapacity of people to understand and practise the genuine ways and ideals of democracy. This will give him a chance to make a preliminary reference to the suppression of democracies in Europe in recent decades which forms one of the sub-units. The pupils should be helped to arrive at a satisfactory understanding of what democracy means through reading, discussion and the teacher's help.

Sub-Unit—2

Democratic Institutions and Communities in Ancient and Medieaval India.

Problem : Is the concept of democracy essentially western or can its origins be traced in the ancient history of India also ?

Concepts to be Developed

1. There are various forms of democracy. In the Indian conception of democracy, stress is on social obligations and mutual help. This may be illustrated with reference to the ideals and the organisation of

(*a*) The Buddhist Sangha.

(*b*) The Buddhist Republics of Ancient India.

(*c*) The organisation of villages as self-governing and self-sufficient communities in ancient India.

2. A certain concept of democracy, rooted in certain moral and social values, has been a sustaining force of Indian life (particularly in the villages) for many centuries, even though the political systems in existence have been quite different from what they are today. Reference can also be made here to Mahatma Gandhiji's insistence on the organisation of our villages as self-governing entities.

3. Our main problem today is to translate this rather vague and limited concept of democracy into social and economic terms suited to modern conditions.

The students will not, of course, discuss the problem in these abstract terms, it is the teacher who should understand this point of view and then present it to the students through concrete examples assessing, that is, appreciating or criticising the past institutions as may be necessary. The object should not be to idealise the picture out of recognition but to make students realise that in some limited but quite real ways, our social life has been based on certain democratic ideals.

Sub-Unit—3

The Story of the American Republic

The students are already aware that the United States of America is, in some ways, the most powerful democratic State in the modern

world. Our economic and trade relations with that country provide a suitable point of departure for introducing this lesson. The pupils should be made to realise that the study of how the United States of America became a Republic is important for us because the modern world has been greatly influenced by what has happened in it.

A general study of the economic exploitation of the American Colonies by the British, with cross—references to Indian history, will enable students to understand the forces that operated to bring about the American War of Independence.

The Americans became a rich and powerful people after they were freed from economic exploitation. How this happened is a very instructive study for us, who have just achieved our own political emancipation. We should, therefore, see what sort of constitution they framed to ensure their proper growth and development.

The study may be conveniently divided into three sections :

(1) The War of Independence.

(2) Declaration of Independence.

(3) Its Results.

Sub-Unit—4

The Story of the French Revolution

From a study of the growth of democracy in America, the students should proceed to the development of the democratic movement in Europe of which France was the first centre and the French Revolution, the first popular expression. The teacher may usefully refer to the influence of the American War of Independence on France. The students should then be confronted with the problem :

What were the causes that led to the great democratic upsurge in France ?

The exploitation of the masses in France was not confined to the economic sphere as in America—it was a large-scale exploitation in the social, economic, and political spheres also and it oppressed the lower and middle classes very badly.

The outstanding events and personalities of the French Revolution should be introduced and passed in quick review with the help of time lines and time charts.

The teacher should bring out the consequences of the Revolution and how it led to the propagation of the democratic ideals on the continent and elsewhere. He should bring home to the pupils that, although the political ideals of the Revolution underwent a temporary eclipse, they exercised a profound influence on the social, moral and intellectual life of Europe.

Sub-unit-5

The Suppression of Democracies

Some preliminary reference to the topic has been made in the teaching of the first sub-unit—the Meaning of Democracy. The teacher should revise the old knowledge and amplify it further.

The topic may be divided into two main sections :

(1) Pre-war period.

(2) Post-war period.

Important Points to be Developed

(a) *Pre-war Period*

(*i*) The economic distress and disaffection in several European countries provided a chance for the dictators.

(*ii*) The widespread development of dictatorships.

(*iii*) The emergence of a world armed to the teeth.

(*iv*) How this situation proved to be a menace to democracy.

(*v*) The basic ideals of the totalitarian states.

(*vi*) The basic ideals of the Democracies.

(*b*) *Post-war Period*

(*i*) The Democracies won the war—give some idea of how much suffering and loss the war entailed.

(*ii*) Real democracy and peaceful international relations did not follow this victory.

(*iii*) The tension and conflict between Russia and the Western Democracies.

(*iv*) The old and the new meanings of Democracy—social and economic democracy as important as political democracy.

(*v*) In order to avoid a third world war, they must learn to settle their differences amicably.

(*vi*) India's policy of peace and neutrality. The "Panch Shila"; the recent lessening of tension.

The period before and after the War is crowded with numerous important events but the teacher should help the pupils to concentrate on general tendencies and movements only and not on isolated facts. Time lines and time charts, as suggested, that the Indian Union has rightly decided to establish as Secular, Democratic State. They should be provided with relevant extracts from the Constitution and should carefully study the statement of its objectives. Then they should undertake a study of what the implications of citizenship are in a Secular Democracy and do so against the backgound of the present situation. The chief object of

this unit should be to give the right orientation to the students' minds and attitudes with reference to this basic issue of our age.

II

Notes for Teachers' Guidance in organizing the Unit.

I. Possibilities of Correlation

The primary object of correlation is a better integration of knowledge and experience and an economy of time and energy. Correlation can be achieved at various levels:

1. Correlation between the various sub-units.
2. Correlation with other Units of the Syllabus in social studies for Grade VII.
3. Correlation with units of Social Studies, syllabus for other Grades.
4. Correlation with other subjects.

The Scheme of Basic Education has rejected the idea of dividing school subjects into water-tight compartments. The teacher must, therefore, be vigilant to utilise the opportunities of coordination which may come his way. The teachers of the old school only correlated the new knowledge with the old but the teachers of the Basic school should also bear in mind the knowledge and experience to be imparted in the higher grades. In the interest of better integration, he can utilise topics from higher grades for facilitating a proper understanding of the concepts and generalisations which he intends to impart in the earlier grades.

Suggestions for Correlation

1. Sub-Unit (ii) can be correlated with work in Civics in Grade VI.

2. The sequential relationship of items (iii) and (iv) can be brought out in the course of teaching.

3. The Suppression of Democracy (Sub-Unit 3 (v)) can be correlated with the study of the Unit on current problems in so far as some of the tensions in the international relationships are due to totalitarian movements studied in sub-unit 3(v).

4. Correlation with Geography.

Map Work:—1. Preparation of the map of the world, showing America, France and other important centres of the Democratic Revolution.

2. Preparation of the map of Europe, showing the spread of the Democratic ideas in various countries.

5. Correlation with Mother Tongue

(*a*) Translations of the speeches of some of the leaders and frontier thinkers of the French and American revolutions and of the

American Declaration of Independence can be included in the text or part of "Expression Work".

(b) Collecting or preparing translations of some poems bearing on the French and the American Revolutions as well as poems of great Indian poets about freedom.

(c) Poems prepared or collected by the students bearing on Independence Day celebrations.

(c) Correlation with Music (where possible); Learning the meaning and the tune of *Jan Gan Man.*

The Marseillaise

The American National Anthem.

II. Creative Activities (Expression Work in Writing, Drawing and Crafts)

The following are some of the types of activities that can be usefully initiated.

(a) Bringing out a Current Affairs Bulletin which should be a permanent feature of the School News Board and the School Magazine.

(b) Preparation of a Time-Line showing the main events of the French Revolution and the American War of Independence.

(c) A pictorial Time Chart of the two movements.

(d) A Streamline Chart of the growth of Democracy.

(e) A pictorial Chart representing the rise and fall of Dictatorships.

(f) Time Lire and Pictorial chart showing the development of the Indian Constitution.

III. Projects and Practical Activities growing out of the study of the Unit

In making the following suggestions regarding possible projects, due attention has been paid to the limited resources of an average Indian school, both in equipment and finance.

Study of Local Activities

1. Attending meetings of the village *Panchayat.*
2. Visits to the District and Municipal Board offices and a first-hand study of their working.
3. A study of the local Trade and Labour Unions (if any).
4. Participation in school elections and its self-governing institutions.
5. Study of local elections.

Dramatic Types of Projects

1. Staging a session of the Indian Parliament or the Provincial Assembly by the School Debating Club. This can also be done in the form of a 'Shadow Play' which is pantomimed on the screen by children passing in profile between a strong light and the sheet (for screen) suspended before the audience.

2. Tableau of democratic assemblies—from the village *panchayat* to the United Nations Organisation Assembly.

3. The Buddhist Sangha (Drama).

IV. A Project on Democracy in connection with the Celebration of Independence Day for Grades VI and VII.

(Time. Two weeks)

1. *Creative Activities*

(*a*) Expression work (written):

1. Preparation of suitable material bearing on the topic-poetry, prose, drama etc.
2. Bringing out a Souvenir, Volume of the School journal.

(*b*) Expression work (Oral):

1. Class "Lecturettes".
2. Debate on some aspect of Democracy.
3. Declamation of great speeches in character—Lincoln, Mirabeau Gandhi, Nehru, Azad.
4. Symposia on suitable themes.

(*c*) Expression Work (Drawing and Handwork)—individual as well as collective, including collection of pictures and album-making; preparation of beautiful, written and illustrated copies of famous speeches and writings of great leaders.

2. *Social Activities*

(*a*) Celebration of the Independence Festival—general planning, issuing invitations, organisation of the meeting, presentation of the programme, preparation of the report.

(*b*) Participation in community programmes.

(*c*) Arranging special features for out-of-school children or adult members of the community.

3. *Open Forum Discussions* (in which all the students may participate).

They develop alert and active thinking, so essential for a democratic society, engender a spirit of tolerance and broad-mindedness and often

stimulate the pupils to further research and investigation into the problem under discussion.

The class tests in social studies (mentioned later) should always be followed by discussions. In the words of a careful student of this type of activity, "Experience has shown that the true-false test, the completion test and the matching test provide excellent opportunities for the defence of the pupils' point of view and for clarifying and applying their knowledge of important concepts and generalisations."

V. Samples of Individual Reading Test on the Unit

The following are suggested by way of illustration to show that the ordinary type of examination questions can be profitably varied in several ways :

(*a*) In each of the following statements, *one* is correct and the rest are wrong. Cross out the wrong statements by drawnig lines through them :

1. Democracy means :

Rule by one while the rest are the ruled.

Rule by a few while the rest are the ruled.

Rule by all while all are the ruled.

2. In a Democracy :

The individual has the freedom to do whatever he likes.

The individual has the freedom to prevent whatever he dislikes.

The individual has not the right to act, if it interferes with others' freedom.

3. In the case of disagreement democracy implies an appeal to :

Physical Force.

Economic Force.

Moral Force.

4. The French Revolution began at :

Marseilles

Bastille.

Paris.

Versailles.

5. The first President of the United States America wa-

Abraham Lincoln.

William Pitt.

Washington.

Malborough.

6. The Americans rose against the English because of:

Religious persecution

Racial discrimination

Economic exploitation

Physical suppression

The above is a sample of the 'Multiple Choice Test' which can be framed by the teacher himself for all units.

Completion Test

1. Complete the following statements :—

The pre-war world was divided into two blocks, the totalitarian states and

Nazi Germany was a.................... State

France is a .... State

India is a .... State.

2. The French Revolution broke out in ....

3. The year saw the publication of the American Declaration of Independence.

4. The Minto-Morley Reforms were introduced in the year.........

5. The Indian Independence Day is celebrated on............. every year.

Matching Test

In this test, the students are expected to match the question with the correct reply. This test can be framed by the teacher without much difficulty. It allows considerable variety of approach ensuring greater interest and activity on the part of the pupils.

Questions	*Answers*
1. Who was:	
The American General who led his people successfully against the English during the War of Independence ?	
English Statesman who supported the American Cause ?	
The greatest frontier thinker of the French Revolution.	
The English Statesman who supported the French Revolution ?	

The teacher must prepare a 'Correction Sheet' for each test for the purpose of self-correction. The answers may be checked by the pupil himself or they may be exchanged among the pupils to ensure more critical assessment.

"Check Sheets" are sometimes used by the teacher to indicate the questions to which the pupil had failed to give the correct answer. They also direct the child to specific pages for further study of the topics concerned.

Chapter IV

MATHEMATICS

Teachers and parents often complain that of all school subjects, children are least interested in Mathematics. This may be true, but there is no reason why it should be so. For there is nothing in Mathematics that need arouse distaste in children. The real cause of this state of affairs lies in the unsuitable content and the wrong approach to the teaching of the subject. Lack of interest is usually the result of failure to adjust the work to the mental maturity of the learner. Interest can be easily created and maintained by relating it to the child's own experience and to the situations he actually comes across in his home, his school and his community. This is why so much emphasis is laid in Basic education on the utilitarian aspect of Mathematics and its connection with craft work and other creative activities.

Aims of Teaching Mathematics

The teacher should aim at:

(*a*) Helping the child to understand the value of the numbers in the ordinary business of living;

(*b*) developing in him the ability to solve quickly and accurately the ordinary numerical and geometrical problems arising out of his craft work and of his home and community life; and

(*c*) affording him opportunities to think to concentrate, to make a sustained effort, to understand and use precise statements in words, symbols or diagrams.

Method

These aims are achieved by using techniques and procedure that make the learning process meaningful to the child.

The teaching of new facts and mechanical operations should be presented in problem-situations which require a knowledge of the new facts or operations for their solution. These problem-situations should be real enough to make the child feel the need to solve them.

The teacher in a Basic school does not need to go out of his way in search of such situations. They are present at every step of craft work and other school programmes. Children are naturally interested in solving these problems, for they come to realise that otherwise their work can go no further. A child who wants to make a tray out of a piece of cardboard or wood feels the need to learn the units of linear and angular measurements. Similarly a child interested in his progress in spinning will find it necessary to add and to subtract. The teacher should exploit such real situations (that crafts abound in) to teach the rules and operations of Mathematics.

As to the general method of approach, the teacher should adopt the inductive method to start with. For children are not generally mature enough to follow the deductive procedure that depends on rigid, logical reasoning. Experience has shown that much time and energy are wasted by insisting that the child must grasp the why and wherefore of every step in an operation from the very beginning.

Inductive method, on the other hand, facilitates the learning process. After the child has been faced by a real problem, he should be helped to reach a practical solution and convinced through verification of its correctness.

Suppose, a child on a particular day has spun twenty-five rounds of yarn ,and the next day thirty-nine rounds. He wants to find out how much yarn he has spun in two days.

What the teacher has to do in this situation is to show the child the way to solve the problem. After eliciting from him that 5 to 9 is 14, the teacher should tell him that the '4' should be placed in the units column and '1' be carried over to the tens, and added to the figures in the tens column. Hence, 1+2+3+6 thus totalling 64.

Ask the child to verify the correctness of the answer by actually counting the number of rounds.

Then assign him similar problems from his own records of spinning, so that he may have the necessary practice in solving sums that entail the carrying of figures.

Important as it is to use the inductive method, we cannot always dispense with the deductive method. It is profitable to learn rules, but the reason for them must be understood at some stage.

Practice

In spite of the fact that there is no lack of real situations for teaching Mathematics in a Basic school, acquisition of the skills needed for success in the subject requires labour and time. One cannot expect to achieve speed and accuracy in solving arithmetical problems that occur in day-to-day life without having a full command of the basic facts and operations of Arithmetic. They have to be learnt by heart through sufficient drill and practice. The teacher should see to it that the responses of children to the basic facts i.e., numbers and tables, are made mechanical, though the task of memorising should be performed not mechanically but with understanding.

In order to make practice and drill effective and lively, we must remember the following:

An important factor in determining the efficiency of practice is motive. Much unmotivated practice is worse than useless.

A child can be motivated to learn a certain fact or operation, if its meaning and relationships with his other activities are made clear. For instance, children who are engaged in growing vegetables in the school

garden, must sell the produce. This situation can be used to induce them to learn multiplication tables. The meaning of these tables can easily be brought home to the children if a vegetable shop is run as a project in the school.

Informing children of their success in learning by appropriate tests also makes for motivation. For the knowledge of success serves as an incentive to further effort.

Drill is useful when individual child constantly makes the same mistake. Group drill should be considered wasteful of time and energy because many children may not need it. However, on occasions when a certain error is found to be very frequent among all children, group drill can be organised fruitfully.

The teacher should guard against the danger of too much learning. It is often felt that children are made to repeat and memorise addition, subtraction and multiplication tables beyond the attainment of a reasonable criterion. Thus, much time and energy are spent for nothing. Moderate initial practice and systematic review are better than learning the same thing continuously for a long time.

Drill periods should be short, as the monotony involved in the drill work produces undue nervous strain, and consequently a loss of interest.

After a fact or principle has been learnt, it needs to be repeated from time to time. At the beginning, the interval between two successive reviews should be short. As time goes on, the length of the intervals should be increased and the duration of practice diminished. No fact or principle should ever be entirely abandoned.

A spirit of play and competition can be usefully introduced to make the process of memorisation less tiresome. This can be achieved by using number games, flash cards, self-directive material.

Varied situations of school, home and community life should be presented to which facts and principles learnt can be applied.

Individual Differences

Every teacher knows that children vary in the rate at which they learn and in their capacity to learn. In Mathematics these individual differences are pronounced, and the teacher should, therefore, organise his classwork in accordance with them, so that each child may attain a measure of success in the essentials of Arithmetic. The assignments should be so graded that each child at every step may experience the joy of surmounting difficulties. The child should be allowed to advance at his natural pace. He should not be forced to wait for others to catch up with him, nor should be goaded into catching up with others who are far ahead of him.

The teacher is advised to adopt this procedure in general. New work should be taken up with the class as a whole, the quick children playing the part of explorers. Then, for practice and drill, the class could be divided into three groups, say, A, B and C—fast, average and slow groups.

The work of the group can be marked outside the class or by each individual, or by the first children to finish the day's work, or they could be made to work in pairs and help each other. They need only occasional help in a hard problem and slight supervision. When they have mastered a certain process or principle, they could be assigned harder work which the other two groups should not be required to do.

The 'E' group needs special attention and supervision from the teacher. Group 'C' requires the teacher's constant attention and care. He should divide his time evenly between groups 'B' and 'C' either by devoting most of the time to one group on one day and the other the next day, or by dividing his attention in the same lesson equitably.

The cooperation of the best children in each group should be enlisted in helping the weaker ones, or in marking their work.

Different groups should be allotted different days for weekly lessons in pure drill work to develop speed and accuracy in fundamental operations.

Oral and Mental Arithmetic

Only the recording of the result and not the intermediate steps is more important for beginners than written Arithmetic. The first ten minutes or so of every lesson can be usefully devoted to mental Arithmetic. For brisk drill in specific operations and for practice in solving a wide variety of problems, children should be encouraged to use mental Arithmetic. They should be so accustomed to this mental work that in making the calculations required in craft work and a number of problems pertaining to home life, they seldom have to have recourse to pen or pencil.

Problem Solving

Plenty of arithmetical problems occur in an average Basic school, where buying of craft material and selling of produce, and keeping of records of craft work are normal activities.

For this purpose, children should be trained to read and understand the problem carefully, to analyse it, to know what is given, what to determine and what process to use in solving it. Children may be asked to extract the necessary data for the problems from their own record of craft work, or for the sake of systematic and graded practice, the teacher can supply the requisite data. Before the computations are made, an estimate of the answer should be gauged and the habit of checking the result should be cultivated.

Definite training in reading and analysing problems should receive ample attention. The oral discussion of the problems should, therefore, form a regular feature of classwork and children should have frequent opportunities to state the solution step by step, with and without mental calculations.

In all work, a premium should be placed on clarity of thought and accuracy in computation. Clarity of thought depends largely on the child's understanding of the conditions given in the problem. Hence, the need to set problems related to the child's own experience.

Accuracy in computation depends not only on the child's competence in the fundamental operations, but on the neatness and orderliness with which the work is set down. The teacher should not, therefore, accept slovenly work, oral or written, under any circumstances.

To sum up, in guiding children to solve problems the teacher should follow the procedure given below:

Help children to state the problem clearly and analyse it correctly.

Encourage them to make their suggestions regarding its solution.

Get them to evaluate each suggestion. This involves criticising the suggestion. Will it lead to the correct solution? Verify the result.

Have them organise their process of solution by drawing outlines of the steps they would take to arrive at the answer.

Evaluation and Tests

There is no place for the usual external examinations in the scheme of Basic education. The teacher must, however, evaluate the work of his children through suitable tests at frequent intervals to determine whether they are acquiring the necessary skills, and to discover where their difficulties lie. On the basis of such tests he must modify, if necessary, his teaching or plan remedial exercises for individual children.

In Arithmetic, it is vital to know the cause of difficulties for remedial teaching because this is a subject in which every step implies a previous step. A child who has not mastered a particular operation, becomes more and more confused and dejected as he proceeds, unless his previous difficulties are cleared up. Every teacher should, therefore, accept the responsibility of seeing that children understand what precedes, before new work is undertaken.

In order to detect the actual weakness of a child in a particular operation, the teacher must first make a detailed analysis of the various steps involved in that operation and then test the child in all these steps. He should also study the child's habits of work and types of error to gain an insight into his mental processes. When specific weaknesses are thus identified, suitable practice material should be provided as a remedial measure.

This procedure of remedial teaching is useful not only in fundamental operations, but also in problem solving. Some children fail here because of reading disabilities, some through carelessness in computation, some because they trust to memorised solutions, and many through lack of reasoning ability. In every case, the teacher should seek sympathetically but earnestly to discover the cause of failure, and take the necessary steps to remove it.

Correlation

The meaning of correlation has already been illustrated at several places in the previous section. Correlation implies the integration of all

related experiences. This is the natural and usual way of learning in life. Even in ordinary schools, good teachers always use the technique of correlation in associating new experiences with old ones to simplify and strenghten new learning. The Basic school offers better opportunities for doing so by providing crafts and other activities in which children are naturally interested and which are rich in educational possibilities.

A craft can be treated as the centre of correlation in two ways :—

1. Directly i.e., certain knowledge and skill pertaining to different subjects may be needed in carrying out the various processes of the craft. Acquiring that knowledge and skill in a real situation will be a direct correlation with the craft.

2. Indirectly i.e., though an item of knowledge or skill may not be indispensable to learning the craft process, it may enrich the craft experience of the child. To impart such an item is, therefore, indirectly correlated with the craft.

Now, a few examples are given to illustrate both kinds of correlation and to show the procedure that may be adopted in teaching certain items of Mathematics

Teaching subtraction in Grade II.

Situation :—Maintenance of Daily spinning record.

Known :—Number of slivers made ; number of slivers remaining after spinning.

To find out :—How many slivers have been used. (Direct correlation). If both numbers are less than 10, the children will easily discover the answer, for they are supposed to have mastered this stage of subtraction in the previous grade. But if either of the numbers is greater than 10, a new problem would arise, for which the children have no ready-made response.

Suppose some of the entries from the children's are as follows :

	Slivers made	Slivers remained
1. . . .	14	2
2. . . .	26	14
3. . . .	16	8
4. . . .	21	12

Unit 1 :—Sums involving no carrying figure.

A. One of the numbers is greater than 10, and the other less than 10 (example 1). Take similar problems from the actual record of the children or from their environment.

B. Both numbers are greater than 10 (example 2).

Unit II : Sums involving carrying figure.

A. One of the numbers is greater than 10, and the other less than 10 (example 3). Use this situation to introduce further subtraction tables. Make children learn them by heart through repetition, flash cards, self-directive material, etc.

B. Both numbers are composed of two digits (example 4). Besides the problems connected with crafts, other problems relating to home and community life should be assigned for practice.

Unit III : Numbers up to three digits.

Teaching Compound Addition in Grade IV Situation (1): Calculating the monthly income from craft work.

Known :—Daily income from the individual craft work (calculated by the teacher)

To find out :—The total income for the whole month (Direct correlation).

Unit I : Mutual conversion of currency units.

Unit II : Addition.

Situation (2) : Calculating actual expenditure on craft work recurring and non-recurring for the whole school.

Known :—Cost of different articles used in craft work (supplied by the teacher.)

To find out :—The total expenditure (Indirect correlation, for this problem does not occur in the course of craft work).

Such problems though indirectly correlated with the craft work serve as appropriate exercises in compound addition, and make craft work more meaningful to the child and enrich his experience.

Teaching to calculate the Volume of a Cube in Grade VI.

Situation : Planning to make a table from wood.

Given : Measurements of the various parts of the table.

To find out : The timber needed for it (Direct correlation with woodwork).

Unit 1 : Concept of volume distinguishing it from surface or area. Unit of volume-cube.

Unit II : Rule for finding out the volume of a cube or cuboid (by cutting it into unit cubes).

For the application of this principle, set exercises from masonry. For example, children should be asked to calculate the cost of the bricks needed in building a house of specfied dimensions, the size of the brick, and its cost price being given.

Chapter V

GENERAL SCIENCE

General Science includes (1) Nature Study, (2) Physics, (3) Physiology and Hygiene, (4) Study of Stars and Planets (5) Chemistry etc.

1. To give an idea of the life history of plants and animals to the children.

2. To show them that the life of plants and animals is inter-dependent.

3. To acquaint the children with the properties of matter and their everyday uses.

4. To help the children to make their lives more interesting, more healthy and more useful.

5. To inculcate in the children the habit of experimenting, observing, inferring and finding out the principles underlying different phenomena.

6. To excite the curiosity of children, in finding out the why and wherefore of things.

7. To remove false notions, dogmatic ideas and superstitious beliefs.

Method of Teaching Science

Teaching Science in the lower grades should be based on children's actual observations and experiences such as keeping animal pets, growing plants, out-door excursions, daily participation in the activities of health, hygiene and cleanliness and various games. This will keep the children's interest alive throughout the study of Science.

In an object lesson, the teacher should show the specific object to the children and ask them to observe its different parts. Then he should ask them to observe minutely the details of each part, and this should be followed by a set of questions and answers: acquainting the children thoroughly with the object under study.

In an experimental lesson the teacher should help the children in suggesting the apparatus and performing the experiment. While performing the experiment, the teacher should ask the children to observe the experiment minutely and to find out the correct readings and finally to draw conclusions and infer the underlying principle. The teacher should also tell the children the life story of the scientist who discovered the principle.

While imparting information regarding the diseases, the teacher should provide facilities to children to observe the signs and symptoms of the patient. He should also use diagrams, models, charts, pictures, filmstrips, slides, etc. to impart scientific knowledge on different items. He may

lead the children to find out the causes of the spread of diseases their preventive measures and their remedies and cures.

Grade 1

1. *Observational*

The teacher should take the children of the first grade on different occasions on excursions to neighbouring places and ask them to observe pet animals, birds, beasts, insects, etc. He should ask them the names of these animals, acquaint them with their shape, size, colour, etc. and show them how these animals eat, drink, grow, move and live.

While on excursions, the teacher should ask the children to observe different plants and trees and thus acquaint them with their names and size and show them that they also require food and water for their proper growth.

The teacher should also ask the children to observe different tools used by the farmers, school articles such as books, maps, furniture, etc. He should tell them their names and show them that these things do not either eat, drink, grow or move.

He can thus impress upon the minds of the children that the things that lie within their environment fall into two groups—(1) things that eat, drink, grow and move and (2) things that do not do so. The first group is termed "living", the second group "non-living".

Plants are living things because they eat, drink and grow.

The teacher should take the children to the school garden or on an excursion to the neighbouring fields and gardens and ask them to name.

(I) Flowering plants and (ii) flowerless plants.

He may ask each child to uproot one wild flowering plant and to observe the different parts —(i) the root, (ii) the stem ,(iii) the leaves, (iv) the flower, (v) the fruit and (vi) the seeds.

After a thorough observation of the different plants, the teacher should ask : How do these plants grow ? How are the seeds of these plants scattered ? How do the seeds germinate ? What are the different parts of a seed ? Which insects visit the plants ?

Where possible, the teacher and the children should gather together early in the morning as well as in the evening on raised ground to observe the sunrise and sun-set. Thus, the teacher should give children opportunities to observe the effect of sunrise and sunset. From these observations children will learn that the day begins with the rise of the sun and the night begins with the setting of the sun.

Ask the children to make observations during the night, when the moon is in the sky and also when the moon is not there. Thus, children should be able to differentiate between dark nights and moonlit nights.

Make the children observe also the effect of clouds in the sky during the day and night.

While cleaning and tidying the class, storeroom or garden the children may come across a spider and its web. Then the teacher should direct the children to observe the spider, its web and later on discuss its structure.

The teacher should take the children to old buildings or uninhabited houses and show them the common wasp. He should tell them the life story of the wasp in an interesting way.

The teacher should direct the children to observe the characteristics of the butterfly, housefly, bee and ant.

He should take the children to the village pond on educational excursions and direct the children to observe the plants growing nearby, the insects enjoying themselves on leaves and flowers of the plants and the various different water birds.

2. *Practical*

The teacher should direct the children to carry out the following processes of cleanliness methodically.

1. Answering calls of nature and passing urine at proper places with due attention to cleanliness before and after the process.
2. Cleanliness of hands, legs, eyes and mouth.
3. Cleanliness of gums by proper massaging and of the teeth by brushing with babool or 'neem' *datun*.
4. Cleaniness of nails and hair.
5. Cleanliness of body and skin, use of cold water.
6. Cleanliness of clothes made with locally available material.
7. Cleanliness of classrooms before and after the lessons. Keeping the floor and the equipment neat, clean and tidy.
8. Cleanliness of school surroundings, drinking water, and the playground.
9. Helping parents in cleaning the house, cattle shed, etc.
10. Cleanliness of bedding by washing it at proper intervals and drying it in the sun.

The teacher should always supervise and guide the children while they are performing the above processes and thus try to inculcate good habits and healthy attitudes into them. He should also caution them on such things as spitting, sneezing and coughing.

Grade II

All items as in Grade I but more detailed and advanced.

Grade III

All items as in Grade I but more detailed and advanced.

Grade IV

1. *Observational*

(A) Plants and Their Parts

The teacher should take the children to the vegetable garden, fruit garden, flower garden and direct them to observe the different parts of plants—root, stem, leaf, flower, fruit and seed.

(B) Growth of Seeds

The teacher should direct the children to examine the dry bean seeds and to observe (*i*) the seed coat, (*ii*) the scar showing the exact place where the seed was once attached to the bean pod.

Then, the teacher should ask the children to soak the bean seeds in water for about six hours and examine the size and the position of the scar minutely. They will see that the seed becomes very much larger in size and feels softer and also that there is one hole near the end of the scar.

Children should be asked to press the seed between the thumb and the fingers and observe the hole. They will find out that a little water comes out of the hole. Tell the children that the same hole supplies the requisite quantity of air and water needed for the growth of the seed.

The children should remove the seed-coating and observe that the greater part of the seed is made up of two large fleshy seed leaves, which contain much food material ready to feed the young plant until it is able to make its own food. The seed-leaves are joined together near the scar by the young seed plant and the tip of the seed root.

Then the teacher should ask the children to pull apart the seed leaves and to observe the seed shoot having a short stem with tiny leaves.

2. *Experimental*

(1) To observe the germination of bean seeds. Ask each child to take a glass vessel lined with blotting paper and fitted with damp sand or saw dust and put the bean seeds between the glass and the blotting paper and to observe carefully daily in the morning and evening the changes that take place in the growth of the seeds and to draw conclusions as follows :

(*i*) Seed-coat first splits up near the tiny hole.

(*ii*) Then the seed root comes out and grows downwards.

(*iii*) The seed shoot grows more slowly and pushes itself out like a hook.

(*iv*) The seedling first feeds entirely on the food stored in the seed-leaves, which gradually become smaller and smaller.

Then ask each child to take out one seedling from the glass and cut off the seed leaves as soon as the seed root and shoot have begun to grow and put it again in its proper place and observe the result.

(*v*) When seed leaves are taken out, the young plant dies for lack of food.

When the tiny leaves of the seed shoot open and turn green, ask each child to take out one seedling and cut off seed leaves and observe the result.

(*vi*) A plant with green leaves is able to make its own food and can manage to go on growing even if the seed leaves are cut off.

(2) To study the germination of maize grain.

Ask the children to perform the experiment just in the above manner and to arrive at the conclusions as follows :—

(*i*) The seed root comes out first and grows downwards.

(*ii*) Then pointed seed shoot breaks through, properly covered and protected with a white skin as it forces its way upwards through the soil.

(*iii*) When it reaches the surface, the first green leaf breaks through the covering skin and unrolls itself.

(*iv*) Other roots soon appear which are not branches of the main root, but start from the seed itself at the bottom of seed shoot.

(*v*) As the seedlings grow the grains become softer and get smaller and smaller as the food material is used up.

Conditions necessary for germination :—

(*i*) Presence of water, (2) Presence of air, (3) Availability of warmth.

(C) Roots and Their Work

Observational :—Children should be given opportunities to uproot one old plant each of carrot, sweet potatoes, beet-root, chillies, brinjals, jowar, maize, etc., and to observe and study the roots. (*i*) Tap roots, (*ii*) Fibrous roots, (*iii*) Storage roots, (*iv*) Prop roots.

Experimental :—(1) To show that the root takes in dissolved mineral matter.

(Perform the red ink experiment.)

(*ii*) Dig up a plant on all its sides very carefully and observe that the roots have pushed themselves through the soil in all directions. It proves that the root holds the plant firmly in the ground.

(D) Functions of the Stem

Observational :—Let the children have opportunities to observe the stems of various plants growing in different seasons and study that some plants have got strong stems while others have weak ones. The weak

and thin stems raise their leaves to the light by other supports. Such plants are called climbing plants. The stems of these plants climb by turning, by tendrils, by thorns and hoods. Some plants have creeping stems that just lie on the ground, while some plants have got underground stems which look like roots. It should be pointed out that the stem bears leaves and buds while roots do not. Onions, ginger and potatoes are some of the underground stems.

The main stem bears leaves and branches. The stems hold the leaves up in the best position for getting as much light as possible.

Experimental :—(*i*) To show that the stem carries water containing dissolved mineral matter from the root up to the leaves.

(Perform the red ink experiment.)

(*ii*) In the same way the stem carries food manufactured in the leaves to other parts of the plants.

(E) Leaves and Their Work.

Observational :—Let the children be given an opportunity to observe the leaves of various plants grown in the school garden or their neighbourhood and find out that the leaves are thin, flat and green in colour. The upper side is smooth and slightly darker.

The main vein is an extension of the leaf stalk. Branch veins run out on either side of the main vein to the edges of the leaf.

Experimental :—To show that the leaves build up the plant's food from the carbon-di-oxide of the air and the water supplied by the roots with the help of sunlight.

Ask a child to take a flask and put some green water weeds in it and then fit up a funnel in the cork and close the mouth of the flask tightly. Then ask him to fill up the flask and funnel with a diluted solution of carbon-di-oxide and to invent a test-tube over it. Keep the apparatus in sun-light and observe the effect. The conclusions are as follows :—

(*i*) Bubbles of gas are formed on the leaves which then rise up and collect in the test tube.

(*ii*) Gas collected in the test tube is found to be Oxygen.

(*iii*) Green leaves take in carbon-di-oxide in sunlight.

(*iv*) Carbon-di-oxide combines with water from the roots and forms a compound of carbon, hydrogen and oxygen named as carbohydrate which soon changes into starch.

(*v*) Starch gives a deep blue colour with iodine.

Thus the leaves prepare food in the form of carbohydrates during the day in the presence of sunlight and they distribute this food to all the parts of the plants during the night.

Some of this food is used up for building up the parts of the plant, some is used up in respiration, i.e. growth and movement of the plant, ; the remaining part of the food is stored in various parts of the plant, some is used up in respiration, i.e. growth and movement of the plant ; the remaining part of the food is stored in various parts of the plant. Remember that :—

(*i*) Rice stores starch in its seeds.

(*ii*) Sugarcane stores sugar in its stems.

(*iii*) The beetroot stores sugar in its swollen tap root.

This stored food is useful to men and other animals.

Experimental :—To show that leaves give out water vapour.

The leaf skin, if examined through a microscope, has a large number of tiny holes through which excess of water is given off by the plants.

However, it should be remembered that green leaves take in oxygen and give out carbon-di-oxide in the dark just like the non-green parts of the plant.

(F) The Parts of a Flower

Observational :—Let the children be given opportunities to observe various flowers grown in the school garden and locality and to find out that the flowers grow from the stem, in the axils of leaves. Use of the flower is to produce fruit and seeds, for which many plants need the help of insects. Flowers have an attractive colour, sweet smell and a sweet liquid, called the nectar. All these things attract insects.

The young flower is enclosed and protected in a bud until it is ready to open. The bud then opens out into a flower, and the greater part of the flower withers away. The remaining part grows in size and becomes the fruit which contains the seeds.

Structure :—The teacher should ask children to open the flower in a longitudinal section and to cut it through lengthwise down the middle and also to cut across the ovary crosswise in order to describe its structure. After careful observation, children should find out :

(*i*) At the lower side of the flower there is a ring of green leaves called the calyx. Each leaf is called a sepal. This cuplike structure protects the other parts of the young flower when it is in bud.

(*ii*) Just above and inside the calyx, there is a ring of large coloured leaves called petals. Show that all these petals together form the corolla. The funnel-shaped corolla is the most attractive part of the flower.

(*iii*) Inside the corolla, there are numerous stamens each with a stalk with a swollen head containing yellow dust called pollen.

(*iv*) Right in the centre of the flower there is the pistil that consists of a swollen seed-box at the bottom. If this box is cut across,

then a good many sections containing numerous ovules are seen from which seeds are developed. From the top of the ovary arises a thin stalk called the style.

Remember that the pistil is a very important part of the flower as it later on becomes fruit containing seeds.

(G) Insect Life

Observational :—Ask the child to observe the ant, butterfly, mosquito or any other insect minutely. If necessary, the teacher should show an enlarged model of any insect or a large sketch of it drawn on the drawing paper. From observations of the above the children should understand that—

(*i*) The body of the insect is divided into three distinct regions (*a*) Head, (*b*) Fore body, (Thorax) (*c*) Hind body (Abdomen).

(*ii*) The head has a pair of feelers and three pairs of mouth parts.

(*iii*) The fore-body consists of three segments. Each segment bears a pair of walking legs, i.e. an insect has three pairs of legs in all.

The second and third segments of the fore-body usually bear two pairs of wings, although a few types of insects are wingless.

(*iv*) The hind-body consists of ten segments, but these never bear legs or wings.

Insects exist in enormous numbers and varieties. Many insects are nuisance because they live as parasites on plants and animals. Some sting, some suck blood, some spread disease and others attack crop plants.

There are two kinds of mosquitoes (*i*) Anopheles and (*ii*) Culex. Anopheles rests in a slanting position while Culex rests with its body parallel to the resting surface.

The female Anopheles must suck blood if her fertilized eggs are to develop. As she digests the blood the eggs develop. Observe the stages of development of a mosquito.

The female Anopheles lays 300 eggs one by one on a water surface. After 48 hours, the eggs hatch out into larva. Then between one and two weeks the larva becomes a comma shaped pupa with a large head and fore-body. It is a resting stage. Then the winged insect comes out.

Give opportunities to children to observe a patient suffering from Malaria and to observe the signs and symptoms, causes, preventive measures, etc. Consult the doctor and let the children know that quinine acts as an effective medicine for Malaria.

(H) Poisonous and Non-Poisonous Snakes

Observational :—The teacher should give opportunites to children to observe the snakes tamed by a snake charmer and find out the dis-

tinctive features of the poisonous and non-poisonous snakes. Point out that only five to six varieties of snakes are poisonous while others are non-poisonous.

If there is a snake bite in the locality, ask the children to observe the wound and the treatment given and to note down the following :—

(*i*) There are two distinct wound marks.

(*ii*) Tie a tourniquet between the wound and the heart

(*iii*) Make a cross-wise cut and fill the wound with potassium permanganate.

(1) *The framework of our body :—*

Observational :—Show the skeletons of man and other animals to the children and ask them to observe and find out through discussion that

(*i*) The skeleton forms the frame of the body.

(*ii*) It gives an animal its definite and characteristic shape.

(*iii*) It protects some of the delicate parts such as brain, spinal chord, heart and lungs.

(*iv*) The parts of the framework are joined together.

Parts of the skeleton are (*i*) the main axis consisting of the backbone and the skull, and

(2) the bones of the limbs hinged to the main axis.

(*v*) To avoid deformity in the bones of the skeleton it is necessary to observe the rules of correct posture while sitting, standing and working.

Muscles :—Ask the children to stretch the hand at first and then to bend it at the elbow and to bring the fingers near the shoulder. Let them observe the muscles of the hand and find out that—

(*i*) Fleshy parts of the body are all muscles.

(*ii*) Muscles are attached to the skeleton.

(*iii*) Muscles enable the animals to move about.

(*iv*) Movements of the body are brought about by the shortening and thickening of muscles fibres.

(*v*) Muscles, which are under the control of the will are called voluntary muscles while those that are not directly under the control of the will, are called involuntary muscles.

(*a*) Voluntary muscles are connected by tendons to bones and are richly supplied with blood vessels. They are arranged in pairs pulling each other in opposite directions.

(*b*) Involuntary muscles are always attached to other muscles and not to bones.

(*c*) Manual work and bodily movements help the muscles to become strong. Voluntary muscles bring about short and rapid move-

ments while involuntary muscles bring about slow and sustained movements.

Respiratory System

Observational :—Show the model of the respiratory system or a chart of the same and ask the children to observe and find out through discussion the following facts—

(*i*) The air first enters the nostrils, where it passes through a winding passage whose walls are covered with a sticky liquid. Dust and dirt are caught by this sticky liquid and hair. Dry air from outside becomes saturated with water vapour as it passes through the nostrils and there is thus no danger of drying up the delicate absorbing surface of the air sacks in the lungs. If the outside air is cold, it is warmed to about the same temperature as that of the blood. This removes the danger of suddenly cooling the delicate lungs. The air is filtered, damped and warmed in passing through the nose. The mouth has none of these safeguards and hence breathing through the mouth is detrimental to health.

(*ii*) Next the air .passes through the mouth cavity.

(*iii*) Then there is the wind pipe, the walls of which are covered with a sticky liquid which is continually flowing towards the mouth, carrying with it any dust that has not been trapped in the nose.

(*iv*) Next the air passes into the lungs.

(*v*) Then the air passes through the narrow air tubes and finally fills in the air sacks. Throughout the delicate walls of these air sacks run networks of capillary blood vessels, where exchange of oxygen and carbon-di-oxide takes place.

Circulatory System

Observational :—Give the children a chance to observe blood under microscope. Show the model of heart and the chart of the circulatory system to the children. Ask them to observe carefully and disover through discussion the following facts.

(*i*) Blood consists of a clear, colourless liquid in which float the red and white cells in the ratio of 500 : 1. The red colour is due to the presence of haemoglobin, a protein substance containing iron, which readily combines with oxygen. The red blood cells are the real oxygen carriers of the body.

(*ii*) Red blood cells are formed in the red marrow of bones and then they enter the blood stream, where their life lasts for a few weeks only. After this, they are broken up in the spleen and in the liver, the waste products being excreted in the bile.

(*iii*) There are several kinds of the white blood cells. One kind of white cells surrounds and digests the bacteria which enter the body. Thus, they defend the body against bacterial infection. In the normal healthy body, white blood cells are victorious

over the bacteria which enter the body. If the skin is cut, white blood cells collect in large numbers to remove bacteria and damaged body cells. The pus, which collects round some wounds, consists mainly of dead white blood cells.

(*iv*) The human heart is a hollow muscular organ with four chambers, two thin walled auricles above and two thick-walled ventricles below.

(*v*) The auricles receive blood from the veins and pass it on to the muscular ventricles which then pump the blood along the main arteries.

(*vi*) The blood carries (*a*) food juices from the intestine to the body cells, (*b*) oxygen from the lungs to the body cells, (*c*) waste products from all parts of the body to the lungs and kidneys.

Recognition of Principal Constellations and Planets

Observational :—When the children and the teacher assemble together for camping on a clear, dark night, the teacher should direct the children to watch the stars forming varied figures such as dippers, crosses and triangles. A star map showing the different constellations should also be used for guidance. Ask the children to make a rule from the map for using stars of one constellation as pointers to show the way to a neighbouring constellation. Thus the teacher and the children together should go on, matching the configurations in the sky with those in the map. Learning the constellations means becoming acquainted with the different star figures. The maps and descriptions that follow are intended to aid in the identification of the constellations.

Direction in the Sky—North in the sky is towards the north celestial pole which is roughly marked by the North Pole Star. Find out how a line through the pointer stars of the great dipper leads to the Pole Star.

Grade V

1. *Three States of Matter*

Observational :—Let the children be given an opportunity to observe all the living and non-living things coming within their experience and find out that each of these things has weight and volume and that each thing is made up of some matter. Thus point out to the children that matter is that which has weight and volume. Simple method of classifying materials is to divide them into solids, liquids and gases. Study them and find out that

(*i*) A solid has definite shape and size.

(*ii*) A liquid has definite size but no definite shape.

(*iii*) A gas has neither definite shape nor size and hence it can be compressed or made to expand.

Change of State

Experimental :—Take solid ice and heat it. Then heat water and find out that—

(*i*) When solid ice is heated, it melts to form water.

(*ii*) When water is heated, it boils and becomes a gas—steam, i.e. ice is solid water and steam is gaseous water or water vapour. Observe also the clouds, fog and rain.

By observing the properties of some materials, it will be seen that they are flexible, malleable, rigid, etc. and due to these properties, all those materials are used in various ways.

2. *In Connection with Heat*

Observational :—Take the children to the smith where the iron rim of the cart wheel is heated and then fitted on round the wooden wheel. Ask the children to observe the size of the rim at the beginning and again when it is hot. This shows that heat expands the rim of the cart wheel and after it is put on over the wheel cold water is poured over it to make it contract and thus fix it firmly over the wheel by contraction. Let the children observe the heating of water and air filled in cycle tubes and find out—

(*i*) All substances expand when heated and contract when cooled.

(*ii*) With solids the expansion is very small; liquids however expand more than solids, while gases expand even more than liquids.

(*iii*) A little space is left out between the ends of railway lines so that they have room to expand on hot days.

(*iv*) Steel bridges are not fixed firmly at both ends but slide on rollers.

Mercury Thermometers

Experimental :—Take three basins containing ice cold water, warm water and hot water. Ask each child to put his right hand in hot water and left hand in ice cold water and then plunge both hands in the warm water and thus feel the difference. This experiment will show that the sense organs of our body are unable to detect the hotness of the body correctly. In order to overcome this difficulty mercury thermometers are prepared. Here a clinical thermometer may be shown and the temperarature of the body of each child measured.

Observational :—The teacher should give opportunities to the children to observe minutely both Centigrade and Fahrenheit thermometers and to find out—

Name of the thermometer	Lower Fixed Point	Higher Fixed Point	Interval between the two points
1. Centigrade . . .	0° c.	100°	100
2. Fahrenheit 0. 0. 0.	0. 32° F.	212° F.	180

Reasons for using mercury in the thermometer :--

(*i*) Its cap can be seen easily.

(*ii*) It does not wet the glass.

(*iii*) It is a very good conductor of heat.

(*iv*) It does not boil and freeze readily.

3. *Mixtures and Compounds*

Let the children observe different materials mixed together and then discover the methods of separating these constituents.

Methods Utilised

(*i*) By picking up the constituents having distinct size and colour e.g. in a mixture of maize and beans.

(*ii*) By using a sieve e.g. in a mixture of sand and stone.

(*iii*) By using a magnet to separate iron from any given mixture.

(*iv*) By winnowing to separate lighter materials.

(*v*) By washing e.g. in the case of tin ore.

(*vi*) By dissolving e.g. in the mixture of sand and salt.

(*vii*) By heating, if one constituent melts at a lower temperature.

(*viii*) By boiling—mixture of liquids.

Examples of common mixtures—(*a*) garden soil, (*b*) air, (*c*) granite, (*d*) brass, (*e*) solder

Solutions : Ask the children to take four test-tubes containing water and to add starch, mud, salt and potassium permanganate respectively. Shake the test-tubes and observe whether the substance remains suspended or becomes one with the liquid. Point out to them that—

(*i*) When a substance becomes one with the liquid and does not settle down, it is said to have been dissolved in water .

(*ii*) Uniform mixture of the substance and the liquid is called a solution of the substance in the liquid.

(*iii*) Oil, grease or wax dissolve in petrol and that is why petrol is used for removing stains of oil, grease and wax from clothes.

(*iv*) Linseed oil dissolves in turpentine and is then used for polishing wood.

Chemical Combination :—The teacher should show by observation and experiment that a good many substances can never be split up into simpler substances. Such substances are called elements. Some of the materials of every day use are very complex and contain several elements. Such complex materials are grouped into (a) Mixtures, and (*b*) Compounds.

In compounds, the elements combine together and undergo chemical change to form an entirely new substance in which the original substances do not keep their original properties. Show that iron rust is not a mix-

ture of iron and oxygen but a compound. Thus point out the difference between mixtures and compounds as follows.

Mixtures	*Compounds*
1. Constituents are mixed together in any proportion.	1. Constituents are present in a fixed and definite ratio.
2. Each constituent retains its own properties.	2. The properties of the individual constituents vanish.
3. There is no chemical force binding the constituents.	3. Chemical action takes place when the constituents combine to form a compound.
4. Constituents can be separated by physical means.	4. Constituents cannot be separated by physical means.
5. There is no change in temperature when constituents form a mixture.	5. There is a change in temperature when a compound is formed.

4. *Heavenly Bodies* :—At night when the sky is clear the teacher along with the children should camp on raised ground and observe the heavenly bodies by using heavenly maps. The teacher should point out the difference between a star and a planet and how to recognise them. Thus, by observing the night sky at different times during the year, the teacher should show that there are nine principal planets including our earth which revolves round the sun. Like our moon, there are 27 other satellites that accompany the planets. Many comets, meteors and planets wheel around the sun. This celestial family including the sun is known as the solar system.

Point out that the names of the planets in order of their distance from the Sun are—

Inferior planets	Mercury Venus	Earth	Inner planets.
Superior planets	Mars Minor	Planets	(Asteriods)
	Jupiter		
	Saturn		
	Uranus		Outer planets.
	Neptune		
	Pluto		

Change of Season :—Any season is good enough with which to begin the study of the constellations. By actual observation, point out that any constellation for each season is situated in a wide band that extends from the north celestial pole past the Zenith and down to the south horizon in the early evening. Most of the constellations associated with a particular season can be found in the east in the preceding season and in the west in the following one.

The Milky Way :—There is a luminous girdle around the heaven that we call the Milky Way. Its central line is inclined 62°to the celestial equa-

tor. It contains countless millions of stars too remote to be visible separately to the naked eye.

A part of the Milky Way arches across the evening skies of the late summer and early autumn. Another part is visible in the skies of winter.

5. Life History of Frog and Butterfly

Observational:—(i) The teacher and the children should observe that the first part of the frog's life is spent in water and the second part on dry land and thus by minute observation find out that the female frog lays its eggs in water (where they are fertilised by sperms poured over them by the male frog).

After some time, the whole egg becomes black (use a magnifying glass for observation).

(*ii*) Then the round ball of cells soon becomes oval and then grows in length. If observed through a magnifying glass, the signs of head, body and tail are visible and the embryo is seen curling up inside it covering of jelly.

(*iii*) The young tadpoles are then hatched and escape from the jelly and feed on the yoke of the egg.

(*iv*) The mouth opens and three pairs of feathery external gills appear on either side of the hinder part of the head.

(*v*) The hind limbs appear first.

(*vi*) Then the fore limbs break through.

(*vii*) The lungs develop slowly and gills wither away. The tail disappears and the tadpole becomes a frog.

Ask the children to observe the body of the frog and note that it has a head and a trunk. It has no neck and tail. Its head is triangular. Its skin is smooth, damp and loose fitting. The hand has four fingers and a foot has five toes joined together by webs of skin.

Let the children be given an opportunity to observe the life history of the butterfly and thus find out that—

(*i*) It lays eggs.

(*ii*) The egg then hatches out into an active larva.

(*iii*) It later turns into a resting pupa.

(*iv*) Finally the perfect winged insect develops out of the pupa and thus the life history of the butterfly is completed.

6. External Characteristics of Fish and Small Cow and Dog.

Let the children observe the fish minutely and then through discussion find out that—

(*i*) The shape of the fish is like that of a boat.

(*ii*) The skin is covered with characteristic overlapping scales.

(*iii*) It has both paired and unpaired fins. The fore fins are in place of hind limbs. They are useful for balancing and steering. The fore fins serve as horizontal rudders. The unpaired fins serve to keep the fish upright in water.

(*iv*) On either side of the mouth cavity, there are gills. When water passes over the gills, oxygen is absorbed by the blood in the gills and at the same time carbon-di-oxide is given out.

(*v*) Eyes have no eye-lids but are covered with a transparent membrane.

(*vi*) Some fishes feed on plants while others feed on small water animals including smaller fishes.

(*vii*) The egg cells produced by the female are fertilised by sperms produced by the male fish.

Snail

Observational :—While on excursion, the children should be given an opportunity to collect snails and observe them minutely and find out that—

(*i*) In its expanded condition the snail carries its spiral shell on the middle of its back with the tip of the shell turned to the right.

(*ii*) The growing edge of the shell is surrounded by a thick muscular collar.

(*iii*) The part of the body outside the shell is oval-shaped.

(*iv*) Beneath the mouth, there is a slime gland which produces slime to smooth the snail's path.

(*v*) The head bears two pairs of horns which can be withdrawn inside the body.

(*vi*) The upper horns are larger and bear eyes.

(*vii*) It has no backbone.

(*viii*) It feeds on the soft and green parts of the plant.

Cow and Dog

Observational :—The children should be given an opportunity to observe various cows of the dairy and to find out their characteristics. Similarly, they should discover the characteristics of dogs.

Food and Digestion

The teacher should find out through discussion the various articles contained in their food and then classify them scientifically into six main groups—(1) Proteins, (2) Carbohydrates, (3) Fats, (4) Mineral salts, (5) Water and (6) Vitamins.

(1) Proteins contain carbon, hydrogen, oxygen, nitrogen and sometimes phosphorus and suphur ; the white of an egg, meat, milk, peas and beans contain protein. Proteins are helpful in building the body i.e. for growth and repair.

(2) Carbohydrates :—They contain carbon, hydrogen and oxygen.

(3) Fats contain carbon, hydrogen and oxygen. Butter, vegetable oils, nuts, egg yolk are the sources of fats. These substances supply energy to the muscle and heat to the body.

(4) Mineral Salts :—Blood, bones and teeth require mineral salts. Most natural, animal and vegetable foodstuffs contain sufficient quantities of salt required by the body.

(5) Water—70% of the human body is made up of water. Water is necessary to bring about chemical changes, for removing waste products and for regulating the temperature of the body.

(6) *Vitamins* :—

Vitamin A is present in cod liver, butter, milk, green vegetables and fruits. It helps healthy growth. Vitamin B is present in the outer layers of seeds and in egg yolk. Absence of Vitamin B causes beri-beri. Vitamin C is present in lemons, oranges, pine-apples, tomatoes, lettuce, cabbage, etc. Absence of Vitamin causes scurvy.

Vitamin D is present in cod liver and in animal fats. Absence of vitamin D causes rickets and decay of teeth.

Vitamin E is present in sprouted seeds, green vegetables and eggs. Owing to a lack of this vitamin, animals are unable to produce young ones.

Show the chart of digestive system to the children and ask them to note the following facts.

Organ of Digestion	Digestive Juice	Substance Digested
1. Mouth	Saliva	Begins the digestion of starchy substances.
2. Stomach	Gastric Juice	Begins the digestion of proteins.
3. Small Intestine	1. Bile 2. Pancreatic Juice 3. Intestinal.	Fatty substances. Remaining carbohydrates, proteins and fats. All remaining substances.

GRADE VI

All items as per Grade V but more detailed and advanced.

GRADE VII

1. *Physical Properties of Air and Water*

Through observation and discussion the teacher should point out to the children that living things are surrounded by non-living things such

as (1) Air, (2) Water and (3) Earth and that these things are quite essential for the growth of living things. Ordinarily, nobody feels the existance of air and hence it is necessary to prove that air is a material substance. It can be done by simple experiments described below.

(*i*) Hold an empty bottle in water with its mouth downwards and through observation and discussion point out that air occupies space.

(*ii*) Hold the same bottle under water with its mouth upward and show that bubbles of air escape as water enters in the bottle.

(*iii*) Take a flask containing a little water and fitted with a rubber cork through which passes a short glass tube having a rubber tubing at one end.

Clip: Heat the flask and let all the water be boiled out. Then fit up a screw clip on the rubber tube. After cooling down the flask, weigh it out. Then take out the clip and observe that the air from outside enters the flask with a hissing sound. Again weigh the flask. Note down the weight as follows :—

(1) Weight of the flask before opening clip . . . gms.

(2) Weight of the flask after opening clip— . . . gms.

(3) Weight of air in the flask— . . . gms.

Explain that the gain in weight shows that air has weight. Gases when heated expand immensely and when cooled contract a good deal.

Children can easily understand through discussion that water occupies space and that it has got weight. However it should be shown that—

(*a*) Water assumes the shape of the vessel in which it is put.

(*b*) Water finds its own level by using different vessels, connected by tubes.

(*c*) Water communicates pressure equally in all directions by using a rubber ball pierced with small holes and filling it up with water.

The Air and Burning

Observational :—Let the children observe that (*i*) by blowing or fanning, fire burns vigorously, (*ii*) when wind blows strongly dry things burn quickly, (*iii*) in a lantern there are holes at the top as well as at the bottom. From these examples of everyday life let them find out how the burning of fire depends upon the supply of air.

Experimental :—The teacher should then perform the following experiments and ask the children to observe and to draw conclusions.

(*i*) Light a short piece of candle and invert a dry jar over it.

(*ii*) Take a trough, put a gas jar stand in it, light a candle and put it over the stand, pour water in the trough till the stand is completely under water, then invert a gas jar over the candle and ask the children to note down—

(a) The height of the gas jar.

(b) The water level inside the jar at first.

(c) The water level inside the jar at the end of the experiment.

Through discussion and questions point out that air is made up of at least two different gases, of which one is used up by the burning candle, while the other is left unused. One fifth of air is oxygen and it supports combustion, while four-fifths is nitrogen which does not support combustion.

Whenever a substance burns, it combines with oxygen and forms oxides. Show this by burning a magnesium wire.

Point out through discussion that the red blood cells carry oxygen from the air breathed in for the needs of the body. Oxygen keeps the body warm and supplies adequate energy for the movements of the body.

By using a light lantern and splinter show that the hot and the burnt air passes out through the top holes of the lantern. Show by closing the upper and the lower holes of the lantern the flame goes out. Thus impress on the minds of the children that for good ventilation there should be separate paths for the fresh air to come in and the hot air to go out so that convection currents may be set in motion.

Experiment 1. :—Put a grain of dye at the bottom of a large beaker of water and then heat the beaker gently over a small flame. Let the children observe and discuss that convection takes place in liquids also.

Experiment 2. :—Insert one end of the iron rod in fire and apply wax at differnt places on the length of the rod and ask the children to observe the effect of heat on melting of wax. Thus point out that heat passes from the hot end to the cold end gradually by conduction. All solid bodies are heated by conduction.

All solid bodies are heated by conduction.

Show also by experiments, such as (i) the ball and ring, (ii) the bar and gague, that the metals expand when heated. Tell the students that the heat of the Sun does not travel either by conduction or convection but by a different method in which the medium is not affected in any way. This method is known as radiation. As we go up on a hilly place, we feel cooler. Another illustration of the same principle is the protection against the sun by using an umbrella.

Radiation and Absorption

Hot objects always give out radiant heat, while cold objects absorb it. However, the rate of radiation and absorption largely depends upon the nature of the surface of the objects.

Experiment :—Take two tins of the same size—one having a brightly polished outside and the other with on damp black coated outside surface. Fit up a thermometer in each of the lids. Then put an equal quantity of boiling water in each tin and place these tins on an asbestos sheet.

Note down the temperatures shown by these thermometers every minute in the followng table.

Time	Temperature	
	Black	Polished
0 minute		
1 ,,		
2 ,,		
3 ,,		
4 ,,		
5 ,, and so on		

The children will draw the conclusion that the blackened vessel cools a little faster than the polished one. This shows that the dull black surface radiates heat better than a bright polished surface.

2. Transference of Energy

Iet the children observe the working of an ordinary clock and find out that the wound-up spring possesses potential energy that is exactly equal to the amount of work done in winding it up. This potential energy is continually converted into kinetic energy, as it becomes unwound in working the clock.

Similarly let the children observe the working of the pendulum and find out that when the pendulum is at rest, it has no energy. In order to set it swinging, it has to be raised slightly for storing some potential energy which enables it to descend to its lowest position. In doing so, the potential energy originally possessed by the pendulum is transferred into kinetic energy which is capable of carrying the bob up on the other side. Thus, it is clear that when the bob goes to the extreme end, it possesses potential energy and when it is in the middle of the swing, it possesses kinetic energy.

3. Propagation of Light

Experiment :—Take three pieces of cardboard and make a small hole in each with a fine needle. Fix all these on wooden blocks so as to bring all the holes at the same height and in the same straight line. Place a lighted candle in front of the first piece of cardboard and ask the children to look through the hole, move any one cardboard slightly aside and observe. This shows that light travels in straight lines.

Let the children observe the images produced by the pinhole camera and discover for themselves that inversion is caused by the light travelling in straight lines.

4. Law of Gravitation :—

Let the children observe a fruit falling from the tree or a stone thrown in the air coming to the ground and then tell the story of Newton in con-

nection with the Law of Gravitation. Give the children opportunites to observe the base and the bottom of a bus, a boat and play toys and find out that the base is flat and heavy while the top is light and narrow.

Experiment :—Take a piece of cardboard. Attach a string near the edge and suspend it from a stand. Draw a vertical line from the point of support. Then, tie a string at another edge and suspend it from the stand. Draw a vertical line from that point of support, the point of intersection of the two lines marks the centre of gravity.

Place the cardboard on the edge of the table and move it gently until it is just about to fall down. See the mark of the centre of gravity and find out that the cardboard does not fall down when the centre of gravity is within the edge of the table. When the centre of gravity is beyond the edge of the table, it topples down. In the balancing toys, the bottom is made heavy by putting lead or mercury at the bottom thus lowering the centre of gravity. In building up motor car, bullock carts, care is taken to concentrate the weight as near to the ground as possible in order to bring the centre of gravity to the lowest possible position. If the centre of gravity is not lowered to the ground, the vehicle is likely to tumble down.

5. Magnetism

Experiment :—The teacher should point out to the children the difference between a piece of iron and a bar magnet by (*i*) placing them in iron filings, (*ii*) by suspending them freely and (*iii*) by rubbing them on an iron bar. Put these pieces in iron filings and show that a magnet (*i*) attracts iron filings, (*ii*) when suspended freely, it rests in the north and south direction and (*iii*) when rubbed on a piece of iron, it imparts its own magnetic properties to it.

The property of a magnet, that like poles repel and unlike poles attract, should be demonstrated. It should be pointed out that the property of a magnet to remain in a north and south direction when suspended freely is made use of in preparing a Mariner's Compass.

Experiment :—Keep a compass needle over a bar magnet. Change the position of the bar magnet and ask the children to observe the directions shown by the compass needle every time and find out that the ends of the compass needle remain in lengthwise direction of the bar magnet. Mark the ends of the bar magnet and the compass needle coming over each other and test these ends by taking the bar magnet in hand and bringing its end nearer to the end of the compass needle. Ask the children to observe that there is attraction, thus showing that these two poles are different. Finally through discussion point out that as the suspended magnet remains in the north and south direction, there must be opposite poles hidden in the earth or the earth itself must be a huge magnet having its south pole in the northern hemisphere and north pole in the southern hemisphere.

6. Rainbow

Ask the children to observe the beautiful arc of a rainbow and to

note the different colours in order, also the relative positions of the sun, the observer and the rainbow. Note that the observer seeing a rainbow always has his back to the sun.

Then, perform the experiment to show dispersion of light through a prism and point out that the result is similar to a rainbow and that white light is made up of seven different colours. While passing through the prism, the rays of the different colours of the sun light are bent to different lengths and therefore a band of different colours is produced. Similarly, when the sun's rays pass through the rain drops, the different-coloured rays are refracted differently and there is a beautiful coloured arc of the rainbow. Here the rain drops act as tiny prisms.

Remember that when reflected rays from an object enter into the eyes, then and then only is it possible to see the object. Light makes the object visible. In a dark room, a bright red flower and a blue silk both appear dark. The colour of the object depends upon the quality of light reflected or transmitted. That is why when we see different objects through coloured glasses, we find that the objects are coloured because each coloured glass transmits its own colour and absorbs all other colours. Similarly a coloured object absorbs all the colours except its own and re-reflects the rays of its original colour. Hence red material appears red because it reflects red light and absorbs all other colours.

The colour of the classroom walls should, therefore, be white to supply adequate light and true colour to the different objects.

7. Lightning and Thunder

When the children observe stormy clouds and the lightning in the sky, the teacher should tell the story of the kite experiment performed by Benjamin Franklin and the way in which he produced electric sparks by bringing a knuckle near the key. Then through discussion, he should point out how the thunder sound of the clouds is produced.

The teacher should cut open an unserviceable electric cell and show the children its different parts with their uses.

(*i*) Carbon rod, (*ii*) Managnese-di-oxide, (*iii*) Cloth or blotting paper,

(*iv*) Ammonium Chloride and (*v*) Zinc casing.

Then take an unused cell and show how the electric current is produced and also show the everyday uses of electricity by charts and discussion.

8. Acids, Alkalis and Salts

Experiment:—Take substances like carbon and sulphur and burn them to form oxides. Dissolve them in water and test the solution with litmus paper and draw the conclusion.

The solution turns blue litmus paper red.

Show the three important acids (*a*) Sulphuric Acid, (*b*) Hydrochloric

Acid and (c) Nitric Acid and prove by experiments the following characteristic properties :

(1) Acids dissolve in water. (2) Acids turn blue litmus paper red.

(3) Solutions of acids have got sour taste.

Find whether lemon juice, tamarind water, butter milk have got acidic properties or not.

Burn the metals such as sodium, calcium and magnesium and dissolve their oxides in water and test the solution with litmus paper and find out that—

The solutions of these oxides turn red litmus paper blue.

Show the common alkalies (*i*) Sodium Hydroxide (caustic soda), (*ii*) Potassium Hydroxide (caustic potash), (*iii*) Calcium Hydroxide (slaked lime) and Ammonium Hydroxide (ammonium solution) and prove by experiments the following characteristic properties :

(1) Alkalies have a bitter taste. (2) Their solutions are soapy. (3) They turn red litmus blue.

Experiment :—Take some dilute acid in a beaker and mix gently, drop by drop, an alkali solution until the mixture becomes neutral to the litmus paper. Then evaporate the liquid and get the remaining substance. This susbstance is salt.

9. The Nervous System.

Use the chart of the nervous system. Give the children opportunities to observe the chart and find out that the nervous system consists of (*a*) the brain, (*b*) the spinal chord and (*c*) the nerves. Then through discussion point out that—

(*i*) The nerves carry impulses from the sense organs to the brain and then from the brain to the various muscles and glands of the body.

(*ii*) The nerves in an animal's body correspond to the network of telephone wires.

(*iii*) The nerves which carry impulses inwards from the sense organs are called sensory nerve fibres and they give rise to the sensation of sight, hearing, taste, smell, touch, temperature, pain, movement and balance.

(*iv*) The nerves which carry impulses outwards to the muscles and make them move are called motor nerve fibres.

10. Let the children be given an opportunity to observe some patients or diseased plants and to find out the signs, symptoms and causes of the disease. While discussing these things, the teacher should point out that the diseases are caused by the smallest possible living things, i.e. bacteria which are also called microbes or germs.

(*i*) They are colourless and exist in the air, water and in the soil.

(*ii*) They require ready-made food either from plants or animals.

(*iii*) Single bacteria measures from .0001 inch to .00001 inch and can be seen only under a very powerful microscope.

(*iv*) Different kinds of bacteria have different shapes such as spherical, spiral or straight chains.

(*v*) They reproduce by splitting themselves. They are ready to divide in about 30 minutes. Thus in ten hours a single bacteria can produce over a million bacteria.

(*vi*) They try to survive even in unfavourable conditions.

(*vii*) Some bacteria are detrimental to health; others are congenial.

(*viii*) Healthy persons have the power to resist germs.

(*ix*) The use of fresh vegetables, fruits, milk, water and other eatables helps to produce resistance to disease.

(*x*) Potassium permanganate, chlorogen and other insecticides help to kill bacteria and control the disease.

11. Our Earth and the Story of Evolution

Tell the story of our earth in an interesting manner touching on the following points.

(*i*) Long long ago our earth existed in the form of very hot gases.

(*ii*) Afterwards it began to cool steadily and turned into a burning liquid.

(*iii*) Then it cooled slowly and the outer cover was formed.

(*iv*) Later on big mountains, plains and valleys were formed.

(*v*) The valleys were then filled up with water to form oceans and seas.

(*vi*) Then, the atmosphere was created.

(*vii*) Afterwards plants began to grow.

(*viii*) Finally living animals came into existence.

Then tell the story of evolution, i.e. the ladder of life.

Amoeba is the first living thing which came into existence. It has the simplest structure and fewest parts. So, we call it the lowest living thing. Higher living things have complicated structures and a good many parts. Thus an organism belonging to the higher species is more efficient and stands confidently in the struggle for existence. Man is regarded as the highest animal. All the living things that exist today have a long line of ancestors behind them, going back to the Amoeba. This has given rise to the theory of evolution. Darwin has contributed much in this direction and his life story should also be told to the children.

Grade VIII

All things as in Grade VII but more detailed and advanced.

Chapter VI

ART

ART IN EDUCATION

Position of Drawing in Schools

In the past, the teaching of free-hand, model-drawing, scale-drawing and geometry was considered suitable for inclusion in the school curriculum. It was believed that this would give the child a little training of the hand and the eye. The purpose was to develop powers of accurate representation of a few shapes and to acquire a little amount of technical skill as would be useful for some skilled crafts. (And the need for it is still greater now as we shall presently see.) It was a matter of mere drawing and the process was mechanical. Consequently, the teaching was simple and methodical. It could not be otherwise for, when the teaching was planned and in conformity with some set principles, there was very little room left for individual initiative and the child was obliged to proceed along the instructions of his teacher. Most of those who took drawing as one of their subjects did so solely for examination purposes, to make up the prescribed number of subjects, just to fill in a gap.

Changed Position of Drawing

Now the position is different. A new conception of a child's dormant and unexplored potentialities has dawned upon the educationist and art is regarded as a suitable medium for the fulfilment of such potentialities. It is now a recognised fact that a child has a natural desire to express himself in some form. It is because of this desire for self-expression that a child feels delight in drawing. His initial efforts at drawing though rough and crude, are full of life and vigour. They are like his language. But if he has to draw in accordance with set instructions, art ceases to be a medium of his self-expression. The vigour is lost and the delight killed. This being so, it is imperative to develop this medium of expression to the fullest possible extent. Here, drawing develops into art and mechanical process is transformed into creative activity.

This throws great responsibilities on the teacher of art. The problem now is, how to retain that spontaneity in the child while helping him to develop his powers of imagination, observation and memory and how to increase technical skill in drawing without destroying his natural desire to express himself.

The teacher should, therefore, know what the child wants to do before prescribing a method. The teacher must see to it that the child passes through various stages of appreciation of form and colour. Basing his teaching of drawing upon the emotions and capacities of the child, the teacher should be able to find a place for art in education. The solution of the problem lies in the careful and sympathetic observation of the child's spontaneous attempts to draw.

Drawing forms a useful adjunct to all subjects of instruction, such as Arithmetic, Social Studies, General Science etc; while imparting instruction in these subjects, drawing should be correlated with them.

FREE EXPRESSION

What it Means ?

A child is inquisitive. He tries to understand the things around him. His memory is filled with all that interests him and that he observes. His mind becomes a storehouse of knowledge.

The child attempts to express himself by drawing upon his storehouse of knowledge, and his memory. But memory has its own limitations. He may miss some links and invent a few of his own. So imagination comes into play and the child puts his own details into the picture he draws in order to make it more attractive, even though these details may bear no resemblance to the impressions he has actually received. He paints a picture of what he likes, not of what we wish him to paint. And he chooses his own method of painting.

Child, an Author: A child's painting is not, therefore, devoid of meaning. He does not create his drawing from out of a vacuum. He is an author striving to portray his ideas more fully in a painting than he can in his speech and this gives him an immense amount of pleasure. He delights in what he paints. In his painting, the child will omit what he dislikes or has no interest in and insert what he likes or is interested in. The creative activity of the child is a continuous process. He will make his painting more accurate, in accordance with his own impressions. Naturally, therefore, he will correct his picture whenever and wherever he feels that is necessary. The child learns what he creates. The knowledge so gained is made use of in his next effort.

The Personality of the Child

Exercises in Art can, broadly, be based upon three interests. First, on the world around the child, secondly, on stories, and thirdly, on design as an applied art form.

Once the teacher attempts to project his own ideas into the child's creation. the child is inhibited.

Teacher's Role

He resents it though the teacher may not know it. One should, therefore, guard against correcting a child while he is busy painting his impressions. But this does not mean that the teacher should not help the child. The teacher should suggest improvements in the painting drawn by the child at appropriate times.

Once a teacher tries to impose his ideas on the child's mind, he harms the child. The child is not allowed to develop his imagination. His creative spirit is stiffled. We may thus make a fine draughtsman of the child but not an artist.

It may be stated here that we must not make a fetish of free expression. This has value up to a certain stage in child life. Beyond that stage, accurate knowledge of the subject to be drawn is necessary and should precede the actual drawing.

Children's Expressional Drawing Class

By way of illustration the plan of art class management which was tried at a school successfully is given below :—

Classroom Management

Keeping in view the very scant accommodation available in the school and also the non-availability of adequate resources for holding an art class, a novel approach was tried both in regard to the seating arrangement and the materials used.

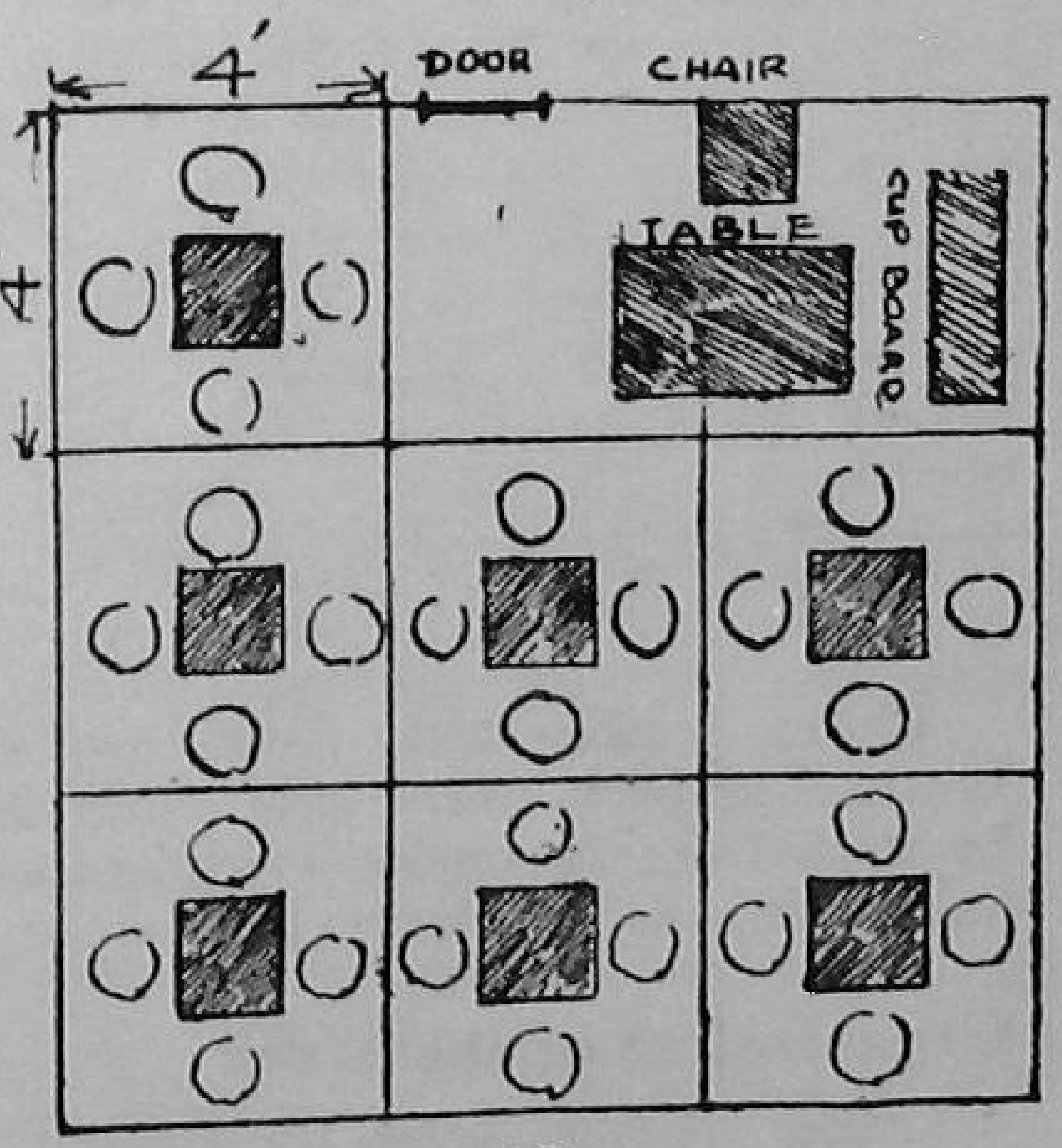
Seating Arrangement

At the beginning easels were supplied to the children so that they might work in a standing position, but it was found impracticable to hold a big class in this manner for want of enough accommodation and easels. This arrangement was therefore changed for a new one.

Four children were seated around a small *chowki* on its four sides as shown in "A"

A

The top of the *chowki* served as a stand to hold earthen cups of colour and a jug for water. In this arrangement, economy of space and safety of colours were ensured.



B

Thus approximately four feet square space can well accommodate four children with one *chowki* in the centre, and a small room, say, 12′×12′ can easily accommodate 28 children as shown in the above plan (B)

Material

Every child should be furnished with a small wooden board, as large as a *takhti* with a board pin fixed at a middle of the top edge to fasten the paper with.

As the usual material is costly, attempts should be made to introduce very cheap material so that every child is able to practise without incurring much expenditure. Old newspapers and used copy books can be coated with black distemper colour for work. Black very easily covers printing or writing and produces a contrast against the colours which are used by children in their work. Children are delighted to work on such coloured paper.

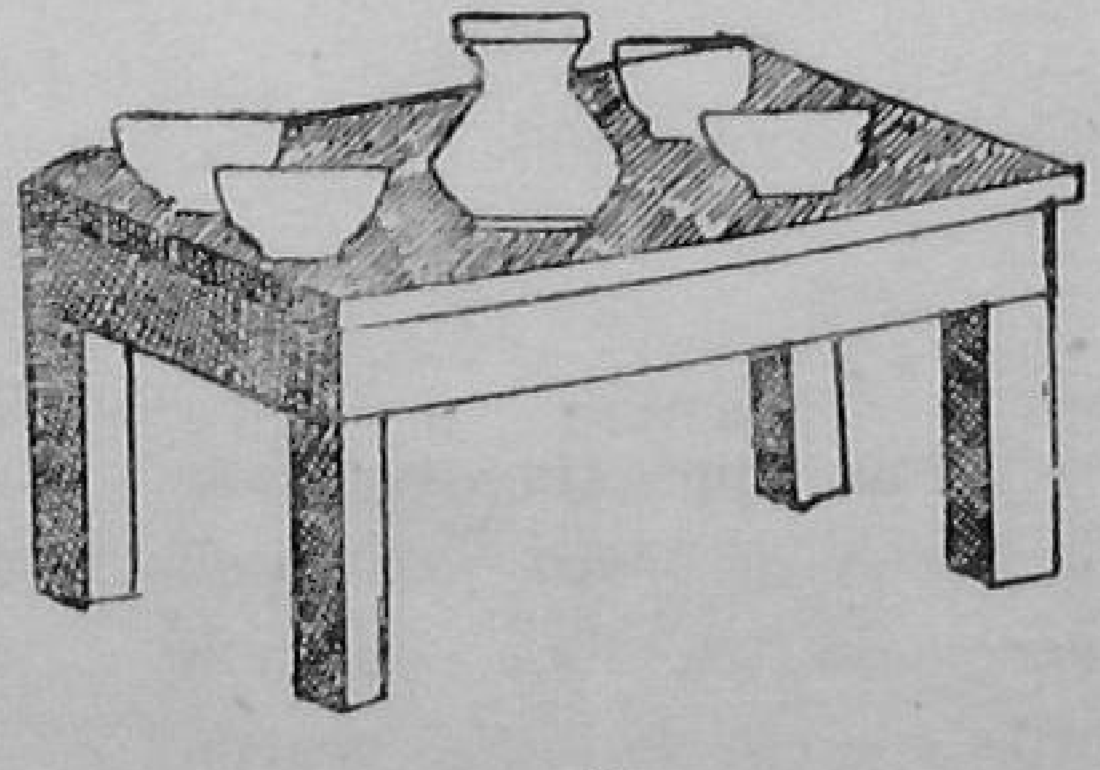
How to prepare coloured paper :—

Place a sheet of old newspaper flat on a wooden board. Apply a coat of black distemper with a 2" painter varnish brush. Care is needed in mixing the right quantity of glue or gum as a binder. If much glue or gum is mixed, the paper shrinks and an uneven surface is produced, and if less of it is added, a slight rubbing will spoil the whole work. To avoid this risk, always apply colour to a small piece of paper, just as a trial, let it dry up and observe the result.

Colours should be used because they are pretty and inexpensive. In the art class ordinary house-painting distemper could be used; in order to make this usable, these colours are ground into finer powder and mixed in glue or gum water and stored safely in glazed earthen bowls.

Small children like bright colours only. So red, blue, yellow and green serve well the needs of our children. Small glazed cups are half filled with these colours and placed over the *chowkies*, four on each.

An earthen jug of water is also placed for cleansing the brush before using another colour, as shown in the diagram (C). In this arrangement, there is less likelihood of colours being wasted. The teacher has to see to the consistency of colour and to add water every now and then as need be. When the colours are wholly or partly consumed, these cups can again be filled in with the colours already prepared and preserved in the class.



C

Cheap brushes made locally are used for economic reasons. Such a brush, if properly used, lasts easily for a month. The brush can also be made from the tender twigs of the palm tree (*Khajur*). A good camel hair brush will yield better results.

Organisation of the Work

Paper, colour, brush being ready for use, seats are arranged so that no change in the seating arrangement is called for, with the coming of

various groups into the class. One group succeeds the other without the least waste of time and energy in getting itself seated properly.

Coloured paper sheets are made available to every new group and after a group has finished its work, their sheets of paper are collected and preserved in files.

This routine is followed every day in the class.

One thing must be borne in mind. The teacher should maintain a separate file for each child containing the record of his day-to-day work. This is necessary to watch the progress made by the child.

Informing a Child's Mind is Necessary.

A child is taught grammar to learn a language, rules of harmony to learn music, and should be taught the principles of aesthetics to learn art. This is essential or else the idea of free expression becomes ludicrous. For free expressional work filled with artistic inaccuracies cannot be appreciated.

Let us take a concrete instance : A child draws a landscape. In doing so, the child must be well-informed. He must know what type of trees, houses, and scenery is found in that particular landscape. If he does not he will use his imagination. Inaccuracies must creep in.

Pictorial References Easier to Understand Than Verbal Discussions.

We have said that a child loves to express himself in making pictures. While doing so, he detects his own mistakes. How is this made possible ? How has he become the critic of his own work ? Obviously he has some knowledge of the picture he makes. Where did he derive this knowledge from ? From his surroundings, from his books, his school or somewhere else. Therefore we must have something concrete for the child which may be constantly referred to, to ensure accuracy in what he draws and to enlarge his mind. This can be done by collections of references.

No amount of words or explanations will make a child realise an object so faithfully in his mind as a picture will.

We have pictures and charts illustrating lessons in various subjects. Similarly we should have pictures and charts for the Art lessons.

Clippings from newspapers may furnish such pictures for the Art lesson. Photographs of pageants, ancient crafts, beauty spots, studies of animal and bird-life, all these may serve as reference materials for the Art Class.

Preparation of References.

Such references should be pasted on cardboard of a set size and numbered and serially classified properly. The references should consist, besides other things, of sport pictures, bazaar scenes etc. for these fascinate a child and arrest his attention.

The aim of using such references is to give the child an idea of the salient and basic features of what is required to be delineated in various subjects. There are some features common to all pictures, more or less. It is only grouping together of some elements that forms a picture. And since no two children think alike, the result cannot be identical or stereotyped. Rather, we may say that originality in a picture consists in the grouping of its elements with the help of a knowledge of those elements.

Basic Elements.

Let us mention some forms which serve generally as the elements of our artistic composition. There are the forms around us such as, sky, houses, rivers, trees, plants, mountains, animals, birds and so on. They vary however in size, shape and appearance. The forms are numerous but each group has some common feature and affinity. The following illustrations will make it clear :—

No. 1. One storey house with a sloping roof : suits a cold climate where the snow falls occur.

No. 2. One storeyed home with a flat roof common in India.

No. 3. Again a representation of the first one but with two storeys.

No. 4. A flat-roofed house as at No. 2 but with two storeys.

The forms of these houses consist of squares or rectangles with some rectangular openings in each storey for its windows, and a bigger space left for the door in the first floor.

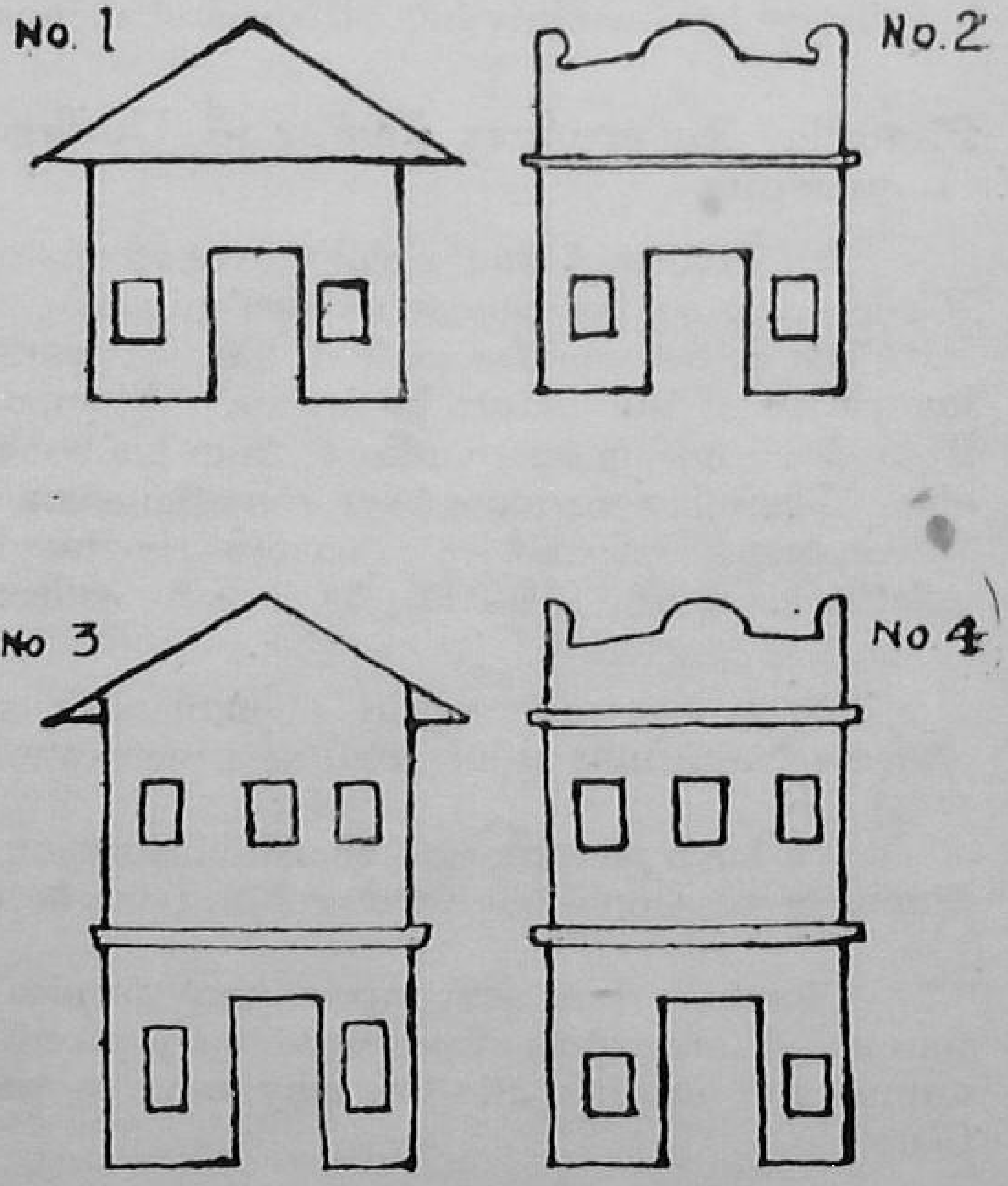


Fig. 1

Here it may also be pointed out that a cottage or a house will often be required as an element in the illustration of stories and the making of pictures, whether it happens to be the chief feature or not,

Now trees :—

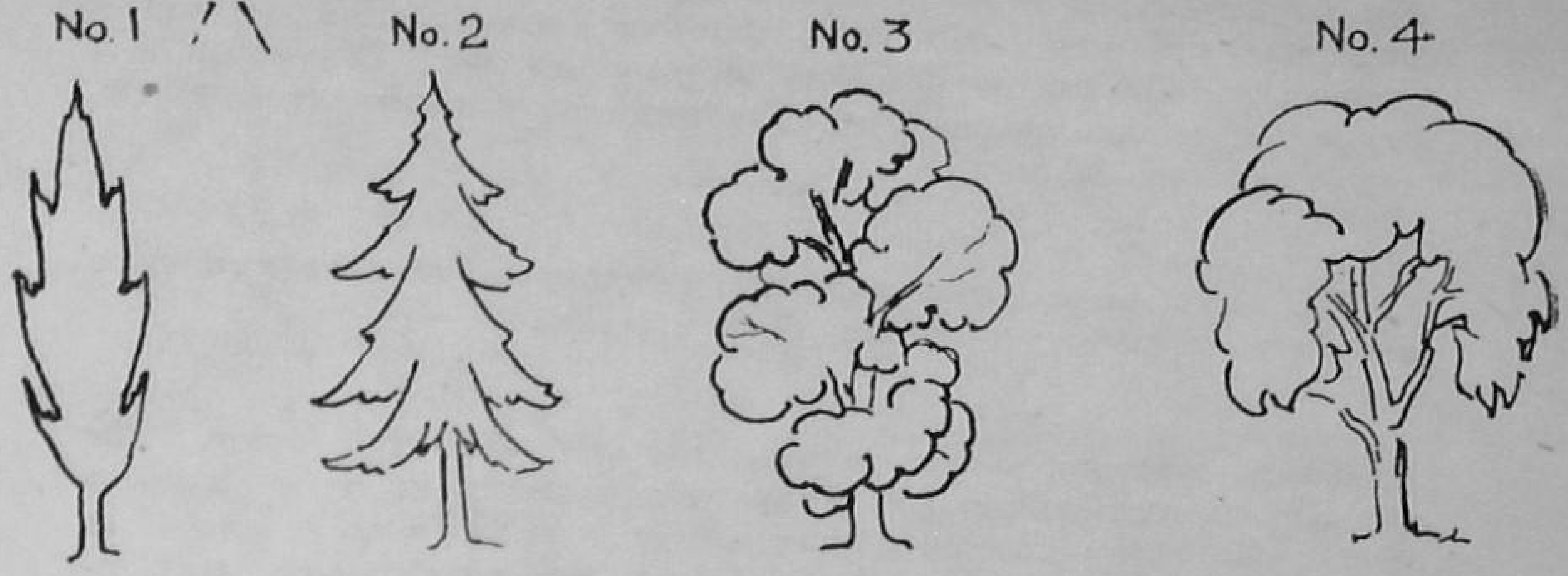


Fig. 2

In figure 2 at No 1 is a common poplar tree with branches shooting upwards on its main trunk.

Contours are not much broken. It has a symmetrical appearance and is conical. The Cypress, a very popular element in Persian and Indian painting bears almost the same shape.

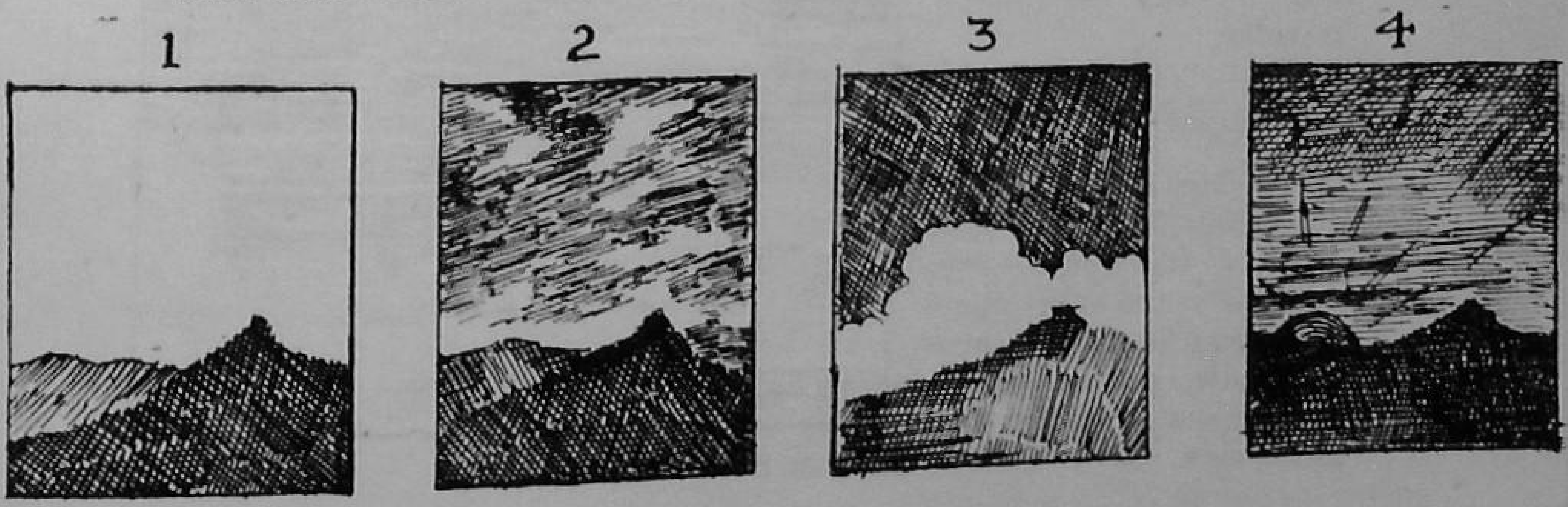
At 2 is a fir tree of pine or deodar with its heavy and pointed branches leaning downwards at their extremities.

At 3 is a magnificent tree like a budd or a chinar. It spreads out its huge branches from the main trunk and a mass of leaf groupings is formed over these. Its contours are much broken and look artistic. The principle of balance is well-illustrated in such forms.

At 4 is a representation of a fruit tree. Such trees also spread long branches which are clothed with leaves where the fruits grow.

Teachers need not mind the imperfections of children's actual drawings in regard to the appearance, size and characteristics of the tree. An observation of the tree or in its absence a talk about the tree may precede and arouse the interest of the child. This will help the child to picture the shape of the tree as a whole, more easily.

There are various distinctive shapes of skies : four illustrations are, however, given. For a small child however, a plain blue sky with white clouds should be sufficient.



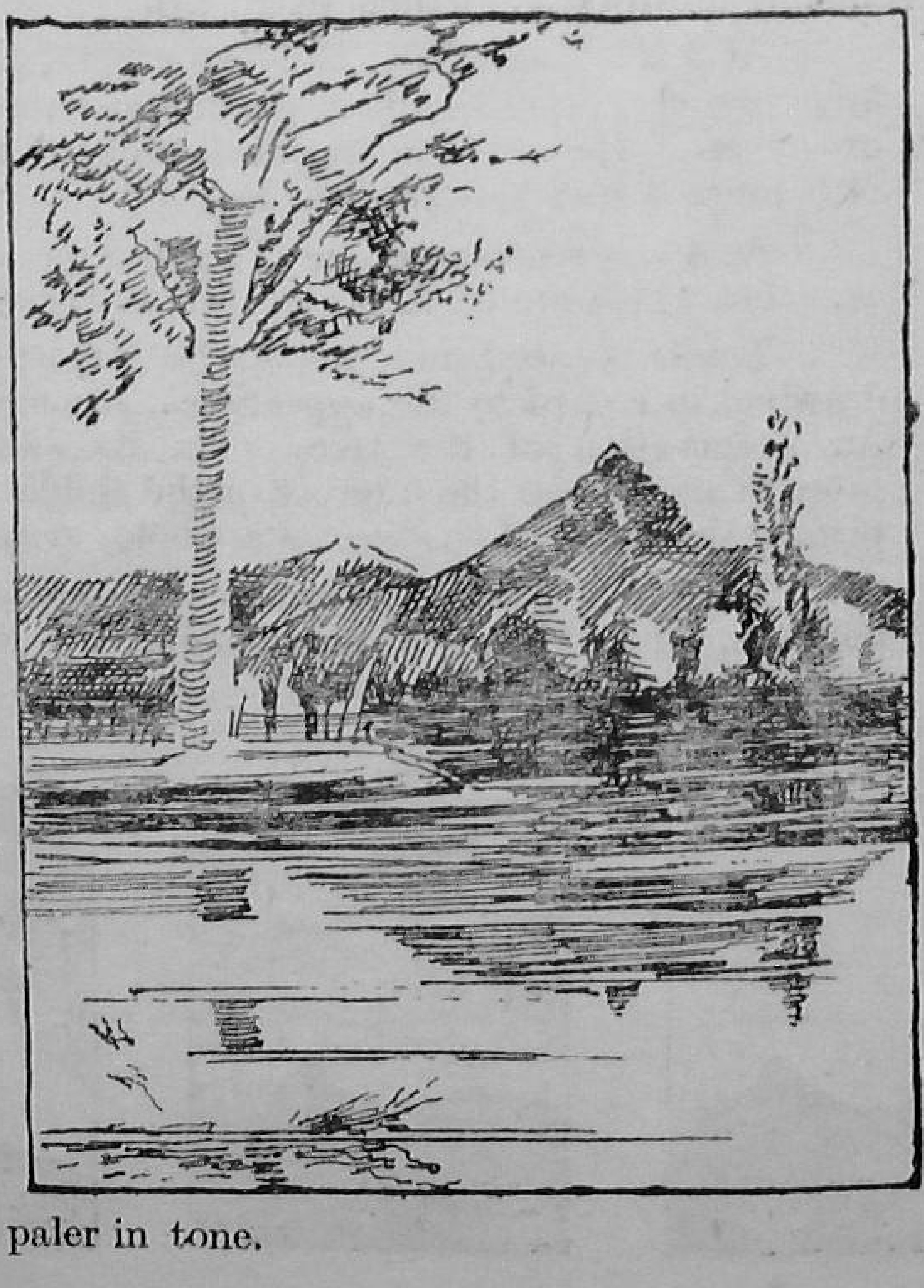
A clear sky as at (1) that can be noticed on a clear, sunny bright day. Feathery clouds on to the clear blue sky as at (2). At (3) we have huge masses of great white clouds touching the horizon. At (4) a good sunset sky. Children are delighted to paint this sky. It consists of a number of colours ranging from blue overhead through green, yellow, orange to red at the horizon.

The sky is an important element in a picture and covers a good space and therefore, merits the attention of the children.

Rivers, lakes and ponds also constitute an element of a picture. The sky and its surroundings are always seen perfectly in rivers, lakes or ponds. Evidently, therefore, when a river is to be drawn, it consists in drawing the sky and other surrounding objects upside down, each reflected part being vertically under the corresponding part of the real object. Note that, usually, the reflection is not a perfect image of the thing itself but generally an irregular mass resembling the general shape of masses.

The illustration at figure 4 makes it clear. Here we have a picture composed of sky, mountain, tree and water. The reflection is shown by drawing long loose streaks across the river horizontally. This can be noticed across the dark reflection of the mountains, grass and tree etc. These streaks give the impression that there is a surface of water above and and that the reflection is seen through the water.

Fig 4.



Notice also that the reflections at some places are broken up into separate parts which give an idea of slight movement in water.

Effects of Perspective.

A child has to conjure up before his mind each part of the picture in relation to the other parts. An object far away must be made smaller than a similar one nearer and it must, as a rule, be made paler in tone.

TEACHING OF ART—ITS SOURCES OF INSPIRATION

SYLLABUS

All our suggestions have flowed from a definite approach to the problem of teaching drawing. namely free expression. We would, therefore, prefer "drawing with an object" to "drawing from an object" for the former method makes a child realise the usefulness of art while the latter makes him feel that it has no purpose and use. To avoid such an unhealthy conception of art being engendered in the mind of a small child, the new approach of freedom of expression in art has been advocated.

Teaching art is a wide subject and the approach and method vary.

So long as it is a matter of mere drawing with a definite set of principles to be referred to and a limited number of subjects to draw, a syllabus could easily be framed. But this is not so in art as a form of self-expression.

No two men think alike or have the same tastes and an identical outlook. This is equally true of teachers of art. All teachers are not similarly trained nor do they work under the same conditions. The children who are taught are not like their teachers. Their likes and dislikes may differ from child to teachers.

There are some teachers of art, who are specialists in a particular branch of art, say portraiture or landscape or applied arts. So the dominant interest in a particular branch of art varies from teacher to teacher. But, for children, we should not prescribe something to the exclusion of something else. A teacher's interest should include all aspects of art.

Again sex makes a difference. The boy's taste and the girl's taste differ. One stresses form, the other colour and so on.

Children belonging to different areas show different capacities and their acquisitions vary. Again children of the same area also show differences as a result of their family, and other environmental background.

The industry of a locality has also its own influence. If the important manufacture of a locality is carpet-making, pottery or furniture, making etc, the child will most likely express himself through such industrial arts leading to pattern designing.

Similarly, if agriculture is the main occupation of a district, ploughing, reaping and other outdoor activities will be the child's engagement and a representation of nature will predominate in his paintings. For a child living in a village, the Book of Nature is itself a syllabus. Flowers and fruits, hills and rocks, birds and animals, rivers and brooks are there to inspire him. His constant association with such scenes will provide him with a basis for art.

Ancient relics, forts, temples, mosques and other specimens of architecture and sculpture will also inspire a love of artistic expression in a child.

Similarly, for a child who lives in the city there are many subjects that supply him with ideas for his art work, for example, a fruit-shop, a bus stand etc. A private shop may provide him both with forms such as a spherical orange, a conical carrot and cylindrical and cubical boxes of fruit, and, with colour such as orange, green, red, yellow etc. Pottery shops with objects of various forms, fancy shops where dolls and and toys are found to fascinate the child and numberless other things and activities of a city form his syllabus.

But, when the impressionable age is passed and a child advances in years and experience, it seems necessary that he should form the habit of accurate observation, and acquire the power of expressing in a few lines the result of observation.

To fulfil this aim, teaching the subjects prescribed for Elementary and Secondary schools such as model and object-drawing, free-hand, geometry and scale drawing are essential.

In addition to these subjects, Nature Study, design, stencilling and an elementary knowledge of colour should also form an integral part of the curriculum of art.

Accordingly, suggestions in respect of each of these subjects, except geometry and scale-drawing that do not come within the purview of Basic education are given in the following chapters.

Free Arm and Free Hand

Drawing is a combination of lines and curves. Consequently, however ardent the desire and spontaneous the expression, one must be able to draw correct lines and curves, upon which the entire art depends. Exercises in free-arm and free-hand drawing are intended to secure this object.

Free Arm Drawing

Control of the muscles of the shoulder and the arm is obtained sooner than that of the wrist and the hand. This naturally suggests picture in fore-arm movement at first.

Free-arm drawing is that method of drawing in which the arm is moved independently of any support. It can be applied to any form of drawing using any medium such as chalk, crayon, pencil, brush and so on.

By the nature of the movements, free-arm drawing leads to a swift, vigorous and easy style.

There are various methods of conducting free-arm drawing lessons. Drawing with the chalk on the blackboard is the method.

Blackboard Drawing

In view of the non-availability of a sufficient number of wooden blackboards and want of ample room, plastered blackboards on the walls may be prepared. The height of the boards should be adjusted to the size of the children.

Each child may be provided with a white or coloured chalk and a duster.

The body is held erect in an easy position and at a fair distance from the board.

The right foot may be advanced slightly.

While at work, a space of a few feet is necessary in order that children may stand well back to see their work occasionally from a distance.

The first exercises should consist of swinging circular movements, the arm being fully stretched out describing a cone of which the shoulder is the apex.

The arm should also swing towards left and right alternately. In this way, drawing circles, semi-circles, quadrants and other simple curves should be made.

Long, horizontal, vertical and oblique parallel lines may be practised, followed by simple geometrical forms such as square, rectangle and triangle etc.

The drawing must be clearly visible from a distance and the execution of drawing should be rapid and direct. The lines should be broad and the drawings simple in character, reducing all details to a minimum.

Free-hand Drawing

For senior students, however, drawing on a limited surface such as paper, in a permanent medium like the pencil is necessary.

Otherwise, the quality of work may suffer for want of training of finger and wrist muscles.

If the drawings of two children with about equal capacity are compared one trained in the free-arm method and the other in the free-hand, the former will have better sense of proportion and form, though he may be poor at detail.

HOW TO HOLD A PENCIL IN FREE-HAND DRAWING

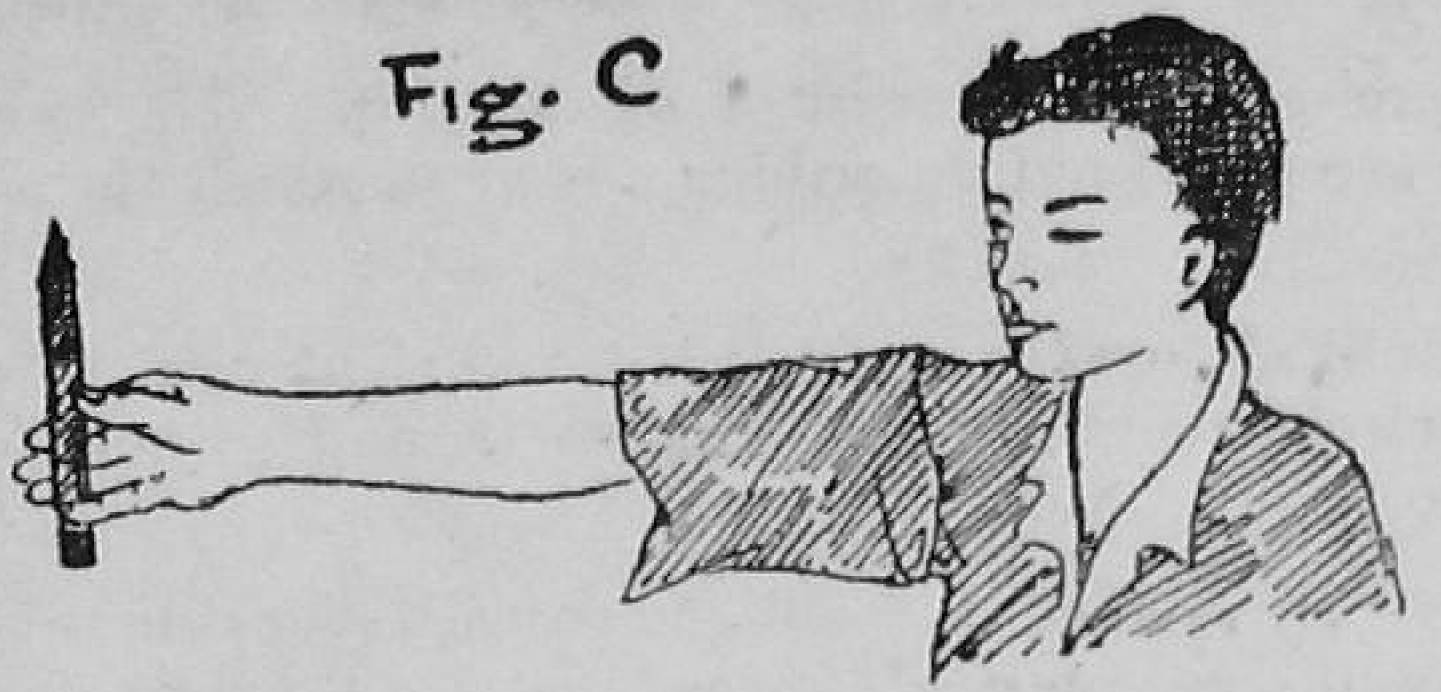
Holding the pencil wrongly is often responsible for deep and rough lines resulting in spoiling the paper. The difficulty arises, mainly because children are accustomed to writing, and writing calls for the direct movement of the fingers, while in drawing with a pencil, the movements come from the wrist and the hand. The pencil therefore should be held in a particular way. The hand is turned on its side, exposing the palm somewhat. The pencil should be held firmly between the lower joint of the first finger and the thumb and rest on the second finger about two inches from the point of the pencil. This distance will vary according to the size of the hand and the length of the line to be drawn. The tip of the little finger should move freely over the paper.

Material

A soft rubber of good quality should be used. It should be used very sparingly to erase incorrect drawing or superfluous lines. It should not be held in the hand while the child is at work as it will get moist and spoil the paper. The part to be used should be cleaned by rubbing it on a corner of the paper.

Pencil :—An H.B. Pencil of good quality should be used. If the pencil is of inferior quality the tip of the lead often breaks and does not give a uniform and even tone in line. The lead should be cut in long strokes and should be blunt at the point at the time of sketching as in the Fig. C

Fig. C



Paper :—For drawing with chalk, charcoal, pastel or colour etc., brown or coloured paper may be used. And for general practice with the pencil, ordinary cartridge paper will do. If inferior paper is used its surface is easily spoiled by rubber, making the drawing dirty and ill-looking.

Mass Form And Cut Figures

We see an object in a mass and get a clear conception of its form. The representation of forms by their outlines is a convention. It is, therefore, necessary to give a child such exercises as may enable him to see the object in a mass form. So exercises in silhouette, black and white and paper-cutting are needed.

Silhouette.

When we paint an object in profile with deeper colours or black on white ground to obtain a strong contrast between the object and its background, we call it a Silhouette.

As has been previously said, a child in his early age is attracted by the form (shape) of an object much more than by its colour and detail. The silhouette, therefore, by its simplicity and vividness helps him to concentrate on it. And this in itself constitutes a gain, since concentration helps a child to understand the object more easily.

The Silhouette is like a shadow. The colour and details are not visible. It can be safely compared with the view of an object from a distance where the colour and details of the object are not visible.

Black and white has a decorative value and drawings in black and white look prettier owing to the harmonious contrast.

Let us differentiate between the silhouette and the black and white method. The difference is clear. When it is needed to emphasise only the general form, whether in a unit or in a group of forms, we use the former method. But if details or individual forms are to be illustrated, we use the latter method.

Paper Cutting.

A child is always delighted to take hold of a pair of scissors and to try it on a piece of paper or cloth to form a pattern. It is thus that he expresses himself. That is why paper-cutting exercises form a part of the curriculum in various schools.

Paper-cutting exercises help develop muscles of the fingers even as they help ensure steadiness of hand.

The purpose and technique are just the same as in the silhouette. But paper-cutting has one advantage over the silhouette. It is more practical and an easier method to make a child know about the form of an object. A child cuts a shape, takes it into his hands, feels it and pastes it on a different coloured paper. All this gives him a very clear conception of form.

Paper-cutting, if practised methodically can lead a child in time to produce very effective and beautiful pictures.

Paper cutting has great utility for pattern design. Let us take an example. A child takes a small sheet of coloured paper, folds it into two halves. Again he folds it to make it four-fold. The process is repeated till the sheet of paper is reduced to small squares or rectangles piled one upon another. He then with his scissors, in a playful mood cuts it at its corners, sides or in the middle, throwing out the bits thus cut. When opened and pasted over another coloured paper, it makes an interesting pattern.

In the same manner any other geometrical figure such as a circle, triangle, rhombus or a star-shaped figure, etc. can be cutout figures pasted against a background on a separate sheet of paper to form all-over patterns.

OBJECT DRAWING

Its Purpose

Object drawing assists the hand to work in harmony with what a child sees with his eyes. Thus eye and hand are happily coordinated. The child has to observe the object before him very carefully. He has to understand the form, appearance and contours of the object and then to draw the result of his observations in lines correctly.

How to Select Objects for Small Children

To begin with, flat objects should be selected for drawing lessons and drawn in front elevations. Geometrical forms such as cubes, boxes etc. should not be placed as models in the initial stages, for they involve the principles of perspective which can be understood only at a later stage.

Natural forms, such as fruits, vegetables etc. may also be placed in. simple positions as models. Children take delight in drawing such models Exercises in free-hand and free-arm drawing should precede exercises in object drawing which may be taken up in the sixth or seventh grade according to the prescribed syllabus of the school. With the attainment of age and standard, the child may reasonably be expected to have developed sufficient muscular power to handle a pencil, and therefore he should be able to understand the fundamentals of model drawing at this stage.

It should be remembered that it is not the appearance or the aesthetic appeal of an object, that determines the choice of a model, but the consideration of principles to be taught and introduced and demonstrated by the drawing of a particular object.

The character of the objects chosen for drawing will largely be influenced by the locality in which the school happens to be situated. In rural districts, natural forms, agricultural and gardening implements will be much more easily obtainable than in towns, where manufactured articles of taste and beauty will be easily procurable.

Seating Arrangement.

Seating is to be arranged so that each child gets an unimpeded view of the object. Seats should be arranged round the object in the form of a circle, semi-circle or horse-shoe. This is an ideal condition for conducting the lesson for probably the object can be equidistant and directly in front of each child in this way. If this is not possible for want of sufficient space in the classroom, the class may be divided into two or three sections with the same object for model.

How to Place an Object.

The object to be drawn must be so placed as it may form a right angle with the line of sight of children (spectator). In other words, children should be seated in front of the object. When so seated, children can record their observations in lines immediately after looking at the object in front of them. Or else, they have every now and then, to change their angle of sight with the result that much of what they observe in the object is forgotten and lost.

Flat objects as recommended for beginners at stage 1 should be placed higher so that children seated behind also get a clear view of the object. Placing such flat models higher will not involve any change in their positions. As a rule, an object should be placed at a minimum distance of six or seven feet from the child and about eighteen inches high from the ground. This rule is by no means absolute or unchangeable. Children who are trained to draw from a fixed height of sight are practically handicapped in drawing when the object is placed above or below their accustomed level, as the object looks different at varying heights. This necessitates a change in the positions of the heights to ensure correct representation. Otherwise lines that should have been drawn downwards will be drawn upwards and *vice versa*. In this way, the child will be able to learn the correct representation of the object when placed above or below his eye-level.

Position of the Paper and Body.

When drawing an object, the position of the body should be erect and the imaginary line formed by joining two shoulder points should remain parallel to the top edge of the paper or the board upon which the paper has been fastened. Moreover the paper or drawing copy should remain parallel to the edges of the desk and should not be turned about. The left

hand should remain on the desk in order to keep the paper or copy book in position. Fig. at (A) makes it clear.

Fig. A.

It should be remembered that for the correct representation of a certain object, erect and unchanged position of the body is very essential. It retains the height of the eye of the spectator in relation to the object at a fixed level, and helps look at the object unchanged.

Change in the position of the paper will also change the horizontal and vertical direction of the lines into oblique ones.

Composition. (setting-out drawing artistically upon the paper.)

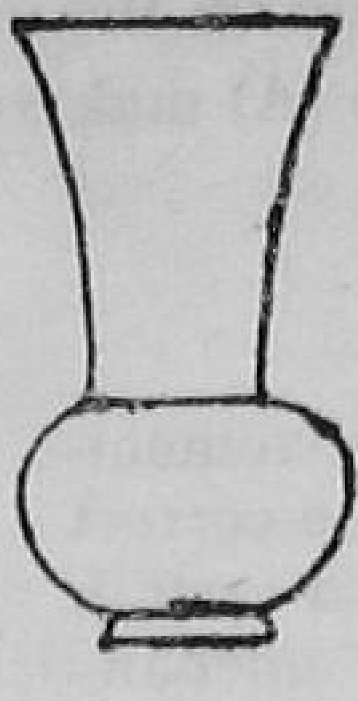
It is generally observed that even the children of higher standards place their drawing sometimes on the extreme left and occasionally on the extreme right of their paper. They may also draw at the top or bottom. Such drawings do not look beautiful. The teacher should, therefore, make the children aware of the principles of picture-composition from the beginning.

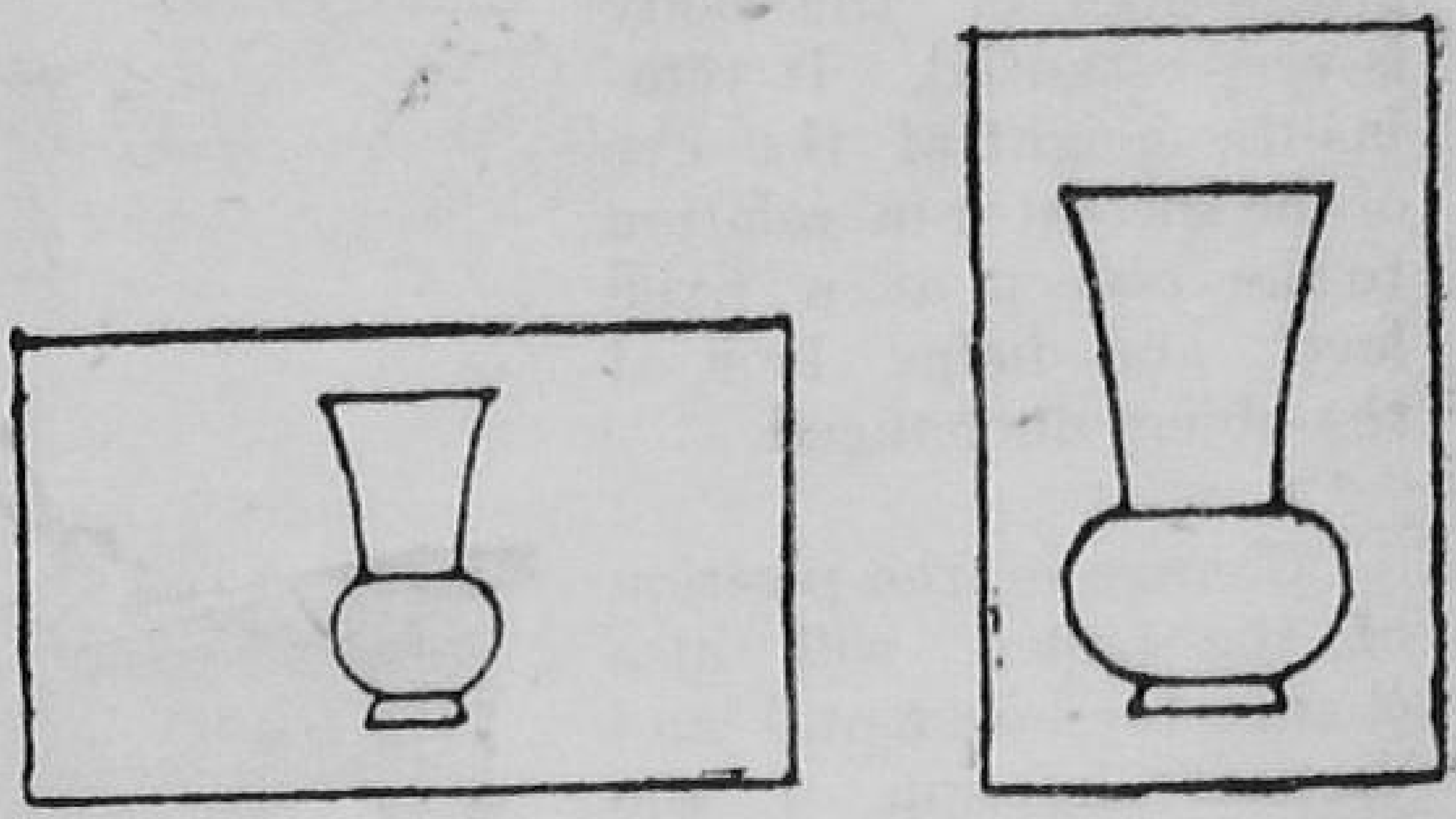
Before the drawing commences the approximate idea of the over-all length and breadth of the object to be drawn may be formed so that the paper on which it is to be drawn may be placed accordingly, that is lengthwise or breadthwise with relation to the length and breadth of the object, with suitable spacing around it.

Suppose the drawing of the given Fig. at B is to be made. Its two drawings have been drawn on two sheets of paper of equal size. One sheet of paper has been placed horizontally (lengthwise) as at (1) and the other vertically (breadthwise) as at (2). Both these drawings have been centrally placed over the paper and the consideration of its all-round spacing has been maintained. But it can be observed that the size

of the drawing at (1) is much diminished and looks unbalanced owing to the open spaces at its left and right hand sides, while in figure (2) by placing the paper vertically to conform with the height of the model, the drawing is comparatively larger and looks well-balanced, with no waste of paper on either side. This is one of the fundamental principles that should be borne in mind while setting a picture on paper.

Fig.B,





1 2

Covering Lines

Before drawing an object, it is helpful to practise describing the contours of the model to be drawn by the first finger. Such drilling will be useful in discerning and memorising the form previous to its actual drawing. Such drilling should continue for a few minutes at the beginning of each drawing till the child obtains a true conception of its form. This will help him when he actually makes its drawing. Such a practice is particularly useful for young children who are thus, able better to understand rightly the direction of the lines and forms of the curves.

How to hold pencil for finding proportion

Before beginning the drawing of an object, we should know the proportion its various parts bear to one another. The following procedure will help in determining the proportion.

The arm should be stretched to its full length and the pencil held vertically against the three fingers and ball of the thumb and the little finger pressed against the inner side of the pencil. In this manner the pencil can be held and the thumb can be moved freely along the pencil.

How to find the proportion of an object

Suppose an object at (D) is to be drawn, by the person shown at (E).

For this purpose it is always useful that the smaller dimension of the model is measured and compared with the greater one.

Hold your pencil horizontally in the manner described and keep th tip of the pencil in line with the eye and the point (A), the left extremity

Fig..D

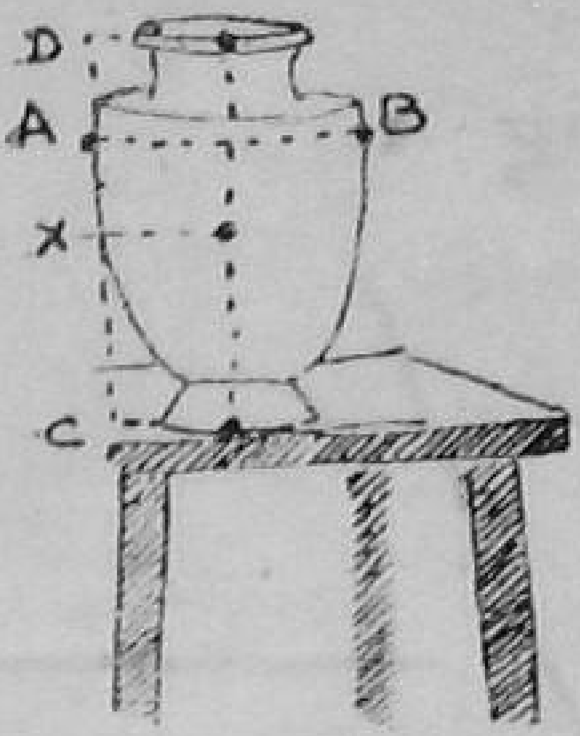
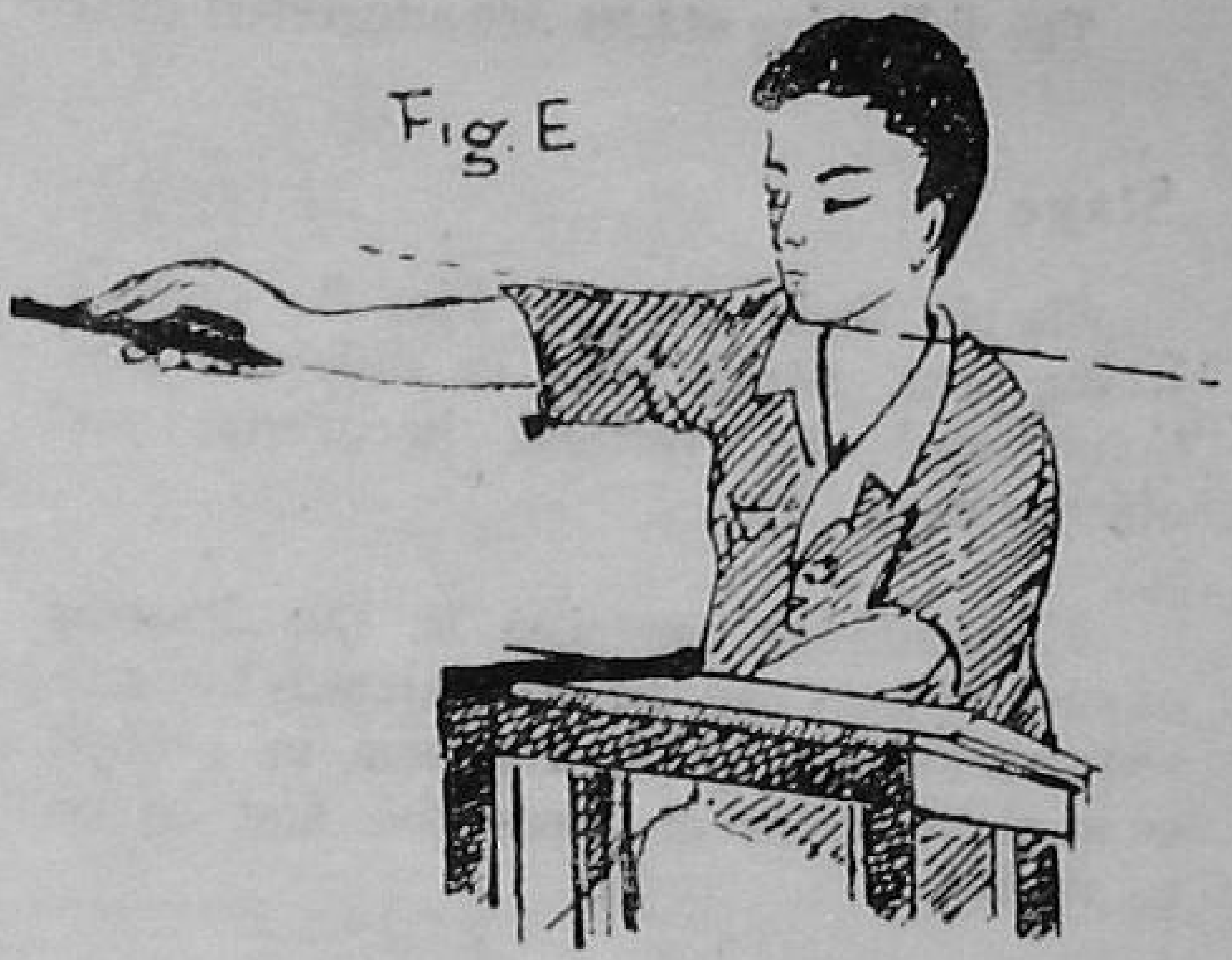


Fig. E



of the object and let the tip of the thumb be on the other extremity of the line at (B). The length of this part of the pencil will represent the overall (maximum) width of the object.

Now change the position of the hand without removing the thumb nail from the mark, so that the pencil is in the vertical position to observe its overall height (CD). See the thumb nail on the point C at bottom and mark the tip of the pencil somewhere on the imaginary line CD, say at (X). The process may again be repeated by holding the hand higher, beginning with the imaginary point (X), and see where the tip of the pencil rests. Suppose it rests at the point (D) or a little above or below it. Evidently the height is about twice the width. In other words, the proportion that width bears to the height is 1 : 2. If the height be still greater repeat the process and find out the proportion. For finding out the relative proportion of its parts the same process may be repeated.

Eye Training Exercise

It is not always necessary that a child should find the proportion of an object as given above. This method of estimating the length of one line by means of exact multiples of another line is sometimes impracticable. Therefore the eye must be trained to judge the proportions and then record measurements accurately.

Lessons should be devised for comparing measurements of objects by simple observation.

Teaching with a System

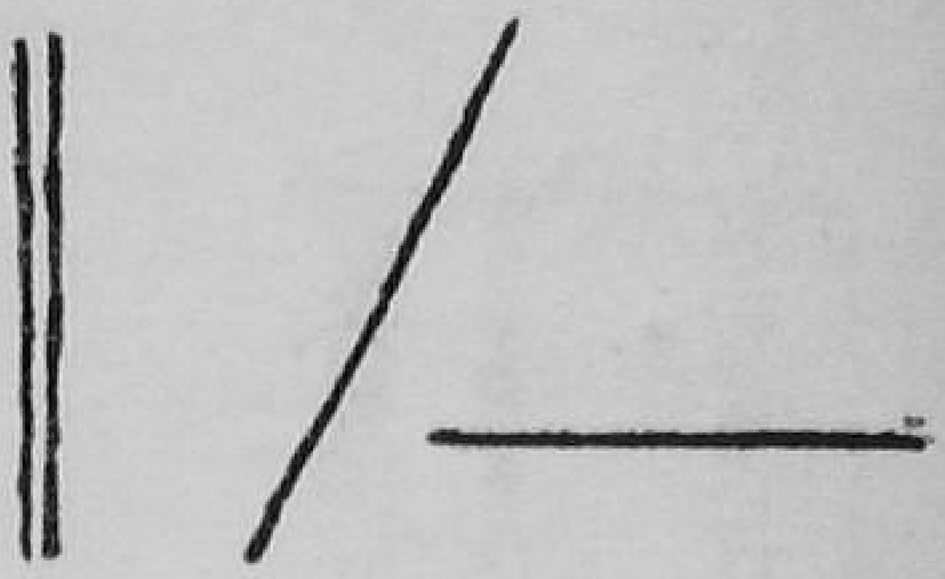
Object drawing, from a simple, straight-lined object, say a pencil, to a complicated object like a landscape has one and the same purpose underlying it, namely, correct representation of the object. It is the basis of all representational art. It is, therefore, necessary to teach it systematically and to equip the child with the technique of representational art.

The following stages are suggested in this regard.

Stage 1

Simple lined objects Fig. A. such as sticks, pens, pencil etc., in different positions, such as vertical, horizontal and oblique as at (A).

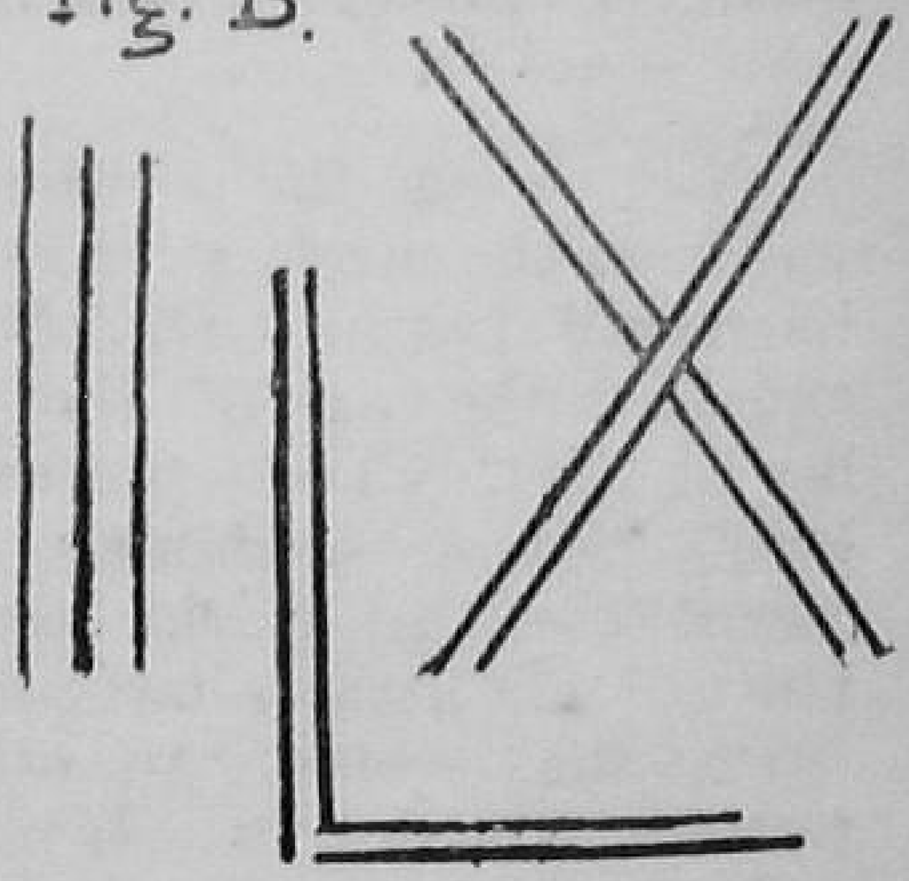
Fig. A



More difficult exercises in the drawing of such objects can be formulated for subsequent lessons, by placing them in groups, or at right angles or cross-wise and so on as at (B).

These exercises will lead to the understanding of simple rectangular or square forms composed of straight lines such as book-covers, blackboards, winders and so on.

Fig. B.



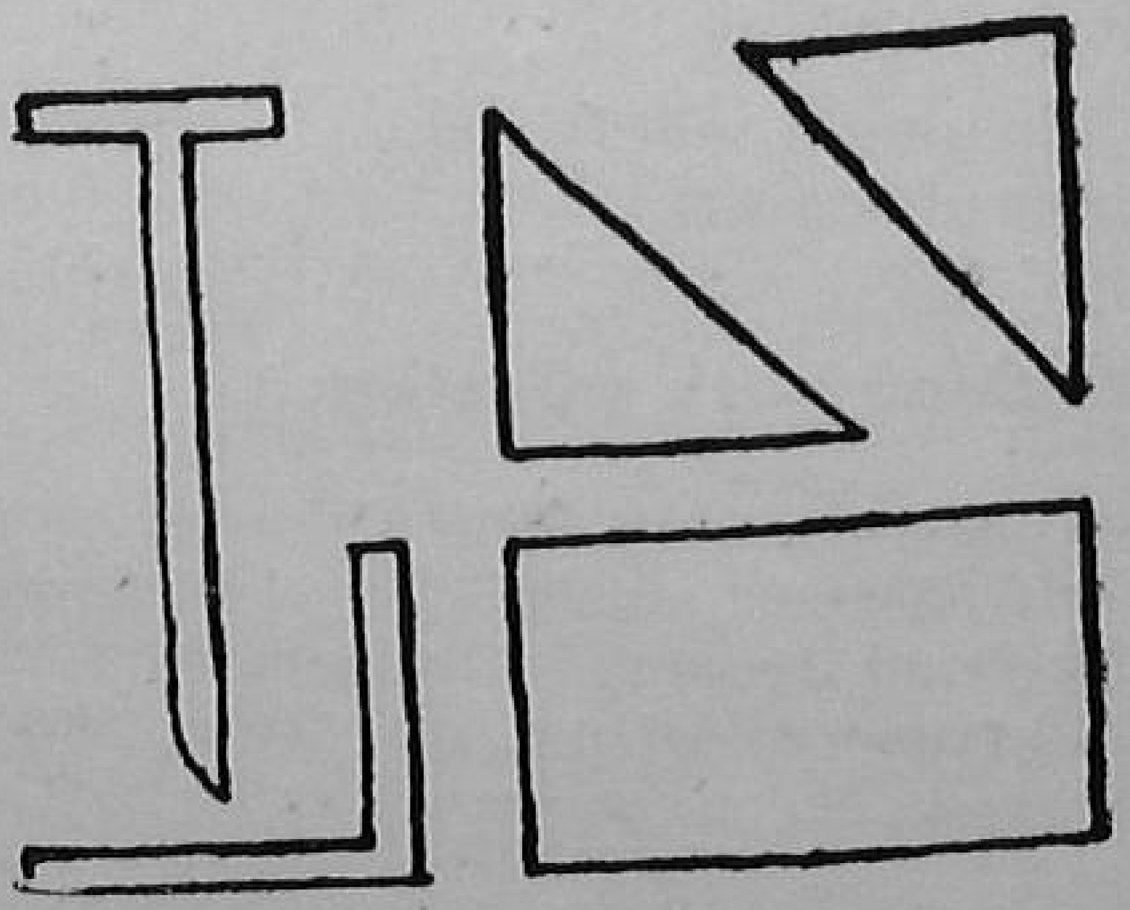
These objects should be drawn in elevations to avoid considerations of foreshortenings etc. Therefore these should be placed parallel to the picture plane.

All the above positions can be obtained by sticking the objects upon the blackboard or by suspending them by a piece of string along the wall or any other vertical surface of the classroom.

When some practice in these exercises is gained, rectangular solids and cubes may be placed as models, and the child may be asked to draw their front elevations only. These exercises will give him an idea of their forms.

Fig. C

When the child has achieved a reasonable amount of efficiency in drawing the objects mentioned above, practice may be given in more difficult forms of rectangular and triangular figures such as T. Square, a pair of set squares in different positions, picture frames, etc. as at (C).



Exercises in circular forms such as coins, watches, wheels etc. may follow the previous lesson. Practice in simple round forms of straight-lined elevations as drum, jar, flower-pot, ink-pots etc. may also be given as at (D).

Stage III

Practice in straight and curved line objects may now follow. At this stage exercises of the objects made of straight and curved lines may be given. These exercises will make the child understand the forms compared of the combination of such lines. For instance the bow and arrows, curved, lined walking sticks, coat hangers etc. will furnish models for such exercises.

Practice in the drawing of fruits and vegetable forms such as apple, cherry, orange, etc, as shown at (E) may also be given at this stage. Such farms will make the child familiar with circular, elliptical and oval-shaped objects. Such exercises can be made more difficult by introducing objects of various compound curves, such as the mango, banana, brinjal, pumpkin, pear, etc., as at (F).

Many more objects of various types mentioned in the three stages can be found and made use of. But the order of practice as suggested should be followed.

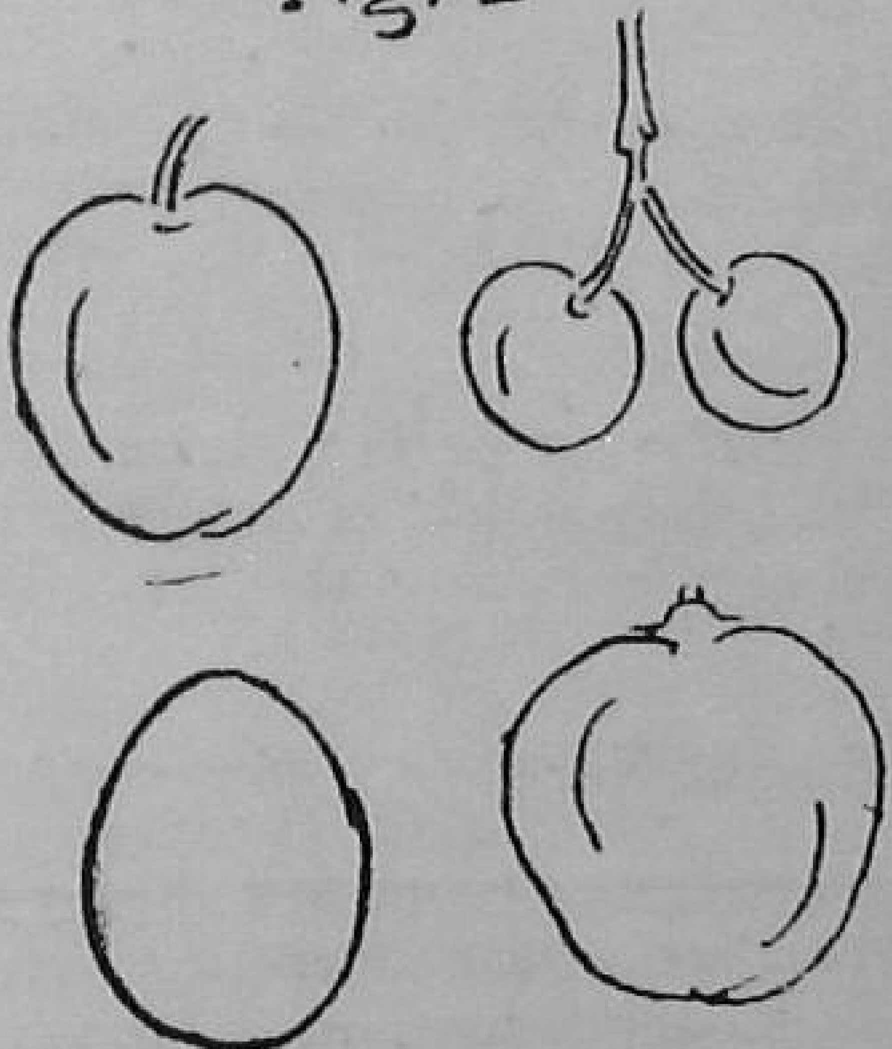
All such models may be drawn in simple elevations only, without placing the models at fixed heights, as is required for regular object-drawing in which perspective is involved.

Stage IV

At the next stage, drawing round objects may be introduced. For the child can reasonably be expected to have learned the drawing of various simple shapes mentioned in the first three stages. The drawings may now be made

Fig. D

Fig. E



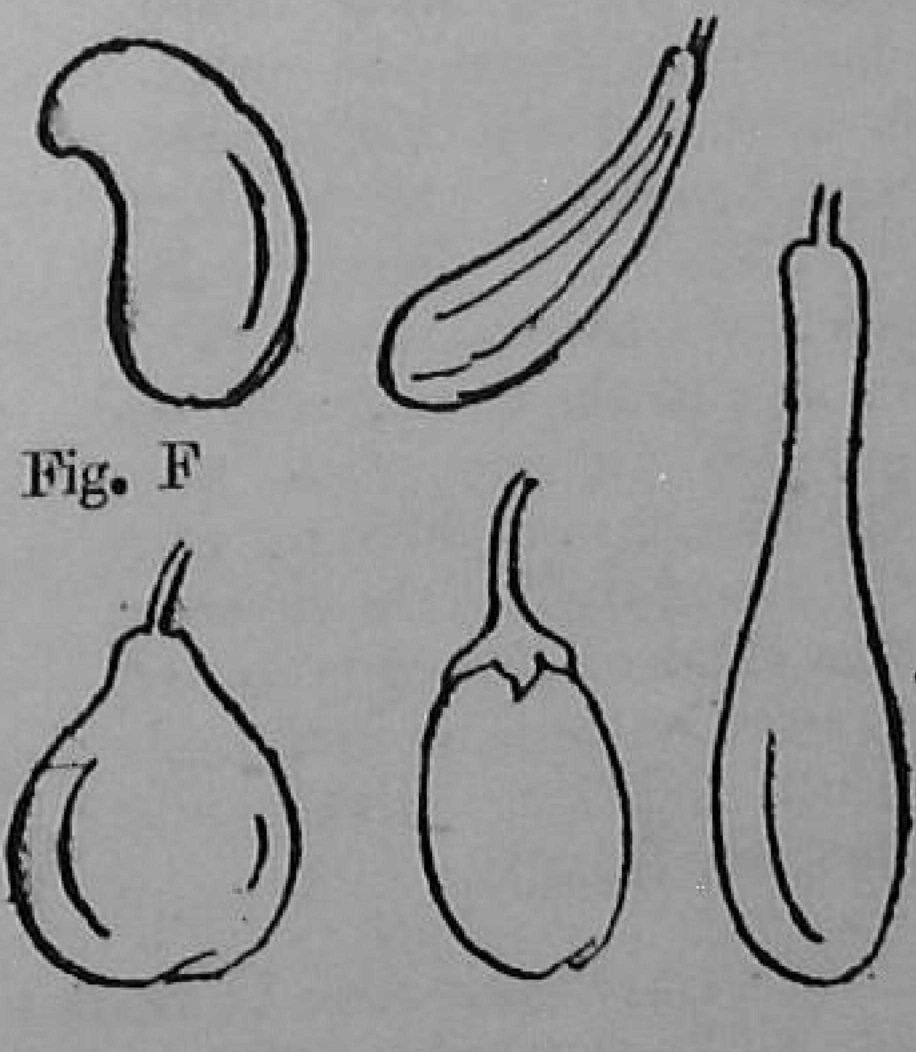


Fig. F

in perspective representation, that is to say, as these actually look from a distance.

Vases furnish different forms. The proportion of different parts, neck, body, and foot should be rightly judged. Varying widths and heights should be closely observed as also the exact shape of the profiles.

Advantages of Round Objects for Small Children

While placing an object as a model formed of straight lines such as a box, brick or any geometrical model in the classroom, difficulty is generally experienced. The object does not look as it actually is when seen at a distance from a particular position. The same object appears quite different when viewed from different positions. Therefore, each child should be made to observe this individually, so that the principles involved in such objects may be fully explained to him.

For example, if a cube or a brick be placed as a model, it will appear quite different to different children new from their seats in the class. To some children it will appear with two surfaces only, front and top, and to some with one surface more left or right. Hence it is advantageous to take cylindrical objects first, as the appearance of such models is not complicated by varying the position of the observer.

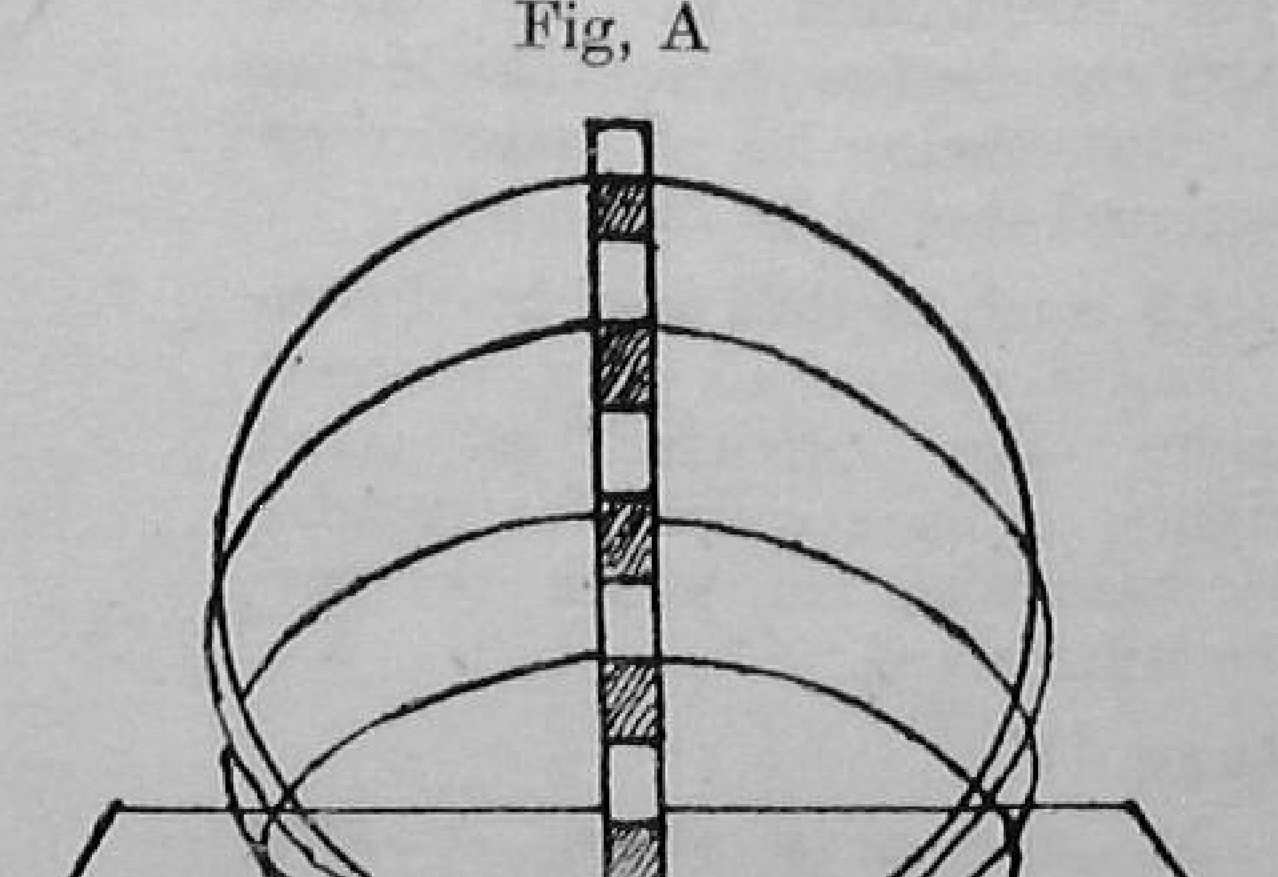
One more advantage that cylindrical shapes offer is that a thorough knowledge of the principles of representation of a circle in a horizontal position alone furnishes us with a key for drawing numberless other round objects.

Therefore, exercises in judging the depths and foreshortenings of the circles and the position of circular surfaces in relation to the observers' eye-level may be given to children. Two experiments are given below to illustrate.

Experiment No. 1

A flat stick may be marked off, say two inches apart. The marking should be bold and at regular intervals. It should be fixed upright with the edge of the desk or the drawing board placed flat upon the table. A cardboard disc of about the same height as the marked stick should be placed vertically against the stick. The surface of the disc should be parallel to the stick and should make a right angle with the line of sight of the children. The children should be seated in rows of three or four in its front and at a reasonable distance from it.

Fig, A



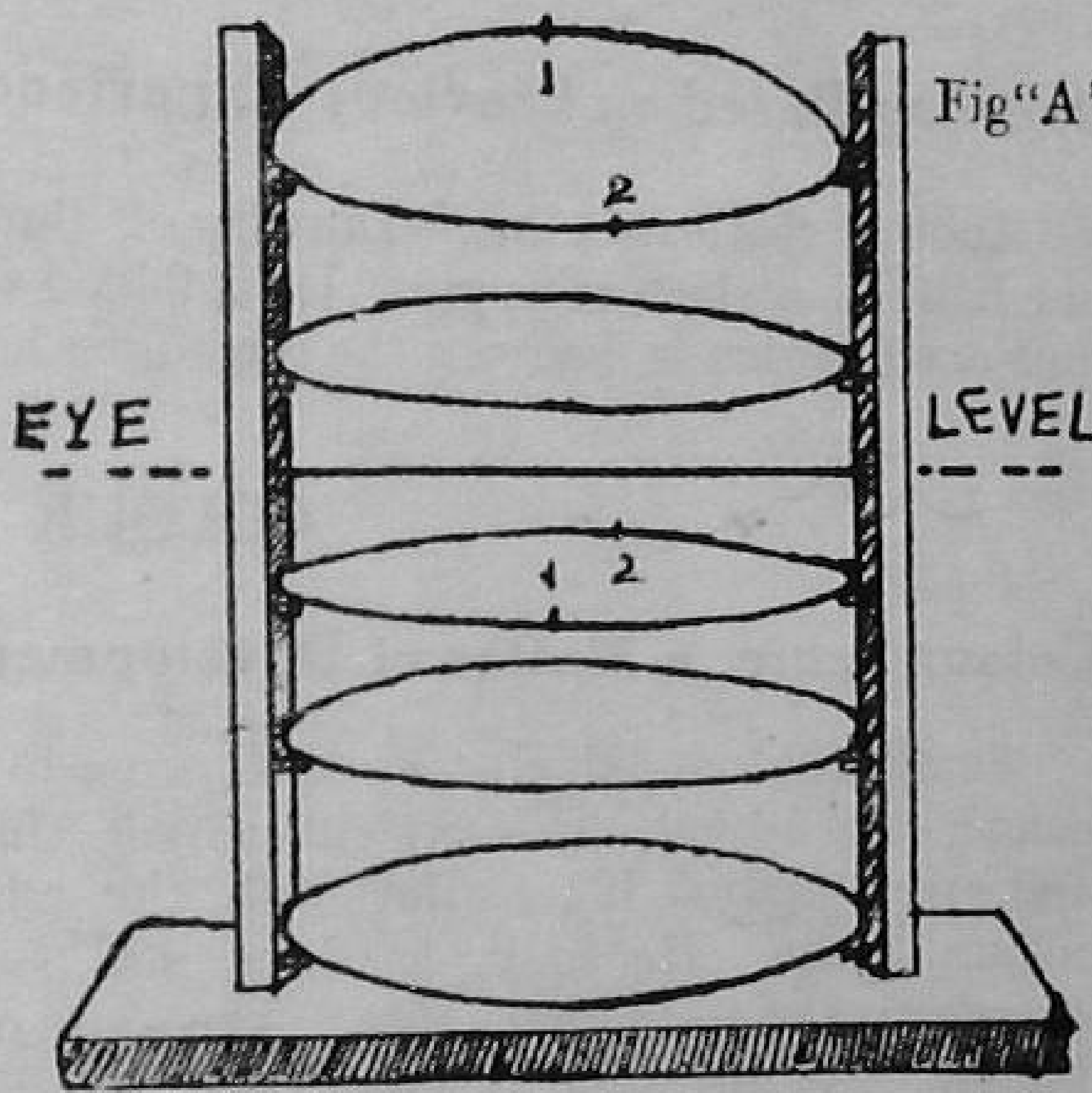
The disc may now be turned back, slowly from its top edge until it is placed horizontally on the board or the desk, to which the stick has been

fastened. While doing so, the disc may be stopped at intervals for the observation of the children and they may be asked to state, when the top edge of the disc seems to meet or touch the marks of the stick. It will be seen that while receding further from the top edge of stick, the disc appears shorter.

During the experiment one eye should be closed to avoid stereoscopic view.

Experiment No. 2

Figure at (B) is an apparatus for demonstrating the apparent depth varying according to the level of the child's eye.



Fix two rods vertically with small blocks attached to them at intervals.

Place the apparatus in front of the children, keeping a disc on the blocks horizontally at various heights. The apparent dimunition of depth (surface of the disc) may thus be demonstrated. When the eye level is reached, the whole surface appears like a horizontal line only. The fact that a horizontal plane of any shape at the eye level appears as a simple line may be demonstrated throughout the experiment. When the disc is moved above the eye level the nearest point in the curve of the disc appears higher than the farthest and the direction of the surface looks apparently downwards.

MEMORY DRAWINGS

Importance of Memory Drawing

Young children draw entirely from memory. Even if they are told to draw from sight only, they will invariably put in some things from their vague recollections about the object to be drawn.

An artist is never confined to copying what he sees before him. He draws from memory too. The picture-content of his mind, his observation and conclusions acquired in similar conditions much earlier are brought to bear upon his work. Suppose a cottage is to be drawn. Someone who has never seen or drawn a cottage before, will do no more than copy, while someone who has previous knowledge of the subject will do more than copy. His drawing will be a creation, not a copy. This clearly shows how important is the role of memory-drawing in Art. Training in memory-drawing is, therefore, necessary.

Suppose a flower-vase has to be drawn from memory. Show it to the children. Ask them to close their eyes and imagine how it looks. Let them have another look and ask them to draw it in the air with their eyes closed. Allow them to look at the flower-vase again and ask them to draw it out in the air. Ask them again to close their eyes and to continue drawing it in the air several times. This done, ask them to open their eyes and place their pencil on paper. Then again ask them to do on paper what they did in the air. Repeated attempts will bring about an improvement in drawing Thus some type of training can be imparted, if in place of asking the children to close or open their eyes, the model itself is covered or uncovered as need be.

Drawing Through the Mind's eye

Drawing Based on Previous Experience

Another method is this:—Drawing of the object from sight is made on one half of a sheet of paper. It is folded to hide the drawing. Then the memory-drawing is made on the remaining half of the sheet.

COLOUR

Colour Sense, a Matter of Development in Children.

Small children exhibit very little sense in the choice of the appropriate colour in painting. This explains why a child may paint a blue sky red and green ground blue. But with the advance of years he develops a colour sense. He may, however, still paint an apple in one flat red irrespective of its various hues. The sense of tints and hues is absent in infants. At this stage, a few colours will do. No explanation of colour theory for infants is needed, for it cannot be reasonably expected that a child of tender years will understand theories of primaries secondaries, tertiaries, adjacents, and still less will he understand complementaries, the principles of harmony, contrast and effects of juxtapositions and so on. If we insist on such drilling prematurely, it will restrict the freedom of the child to observe and apply colours.

Choice of Colour

A few colours should be made available to a child. He will make his choice amidst these. For children are fascinated by certain colours. A child generally selects yellow, red, blue and green. Why so ? Partly because they are bright and attractive. So always provide bright colours to a child.

Study of natural colour schemes essential.

Let the child be stimulated to look at natural colour schemes. He will execute them into his design and picture and so cultivate a habit of observation, appreciation and analysis.

But a stage comes in the child's life when it is desirable to impart to him the knowledge of colour theory.

In the given figure (A) each circle may be covered with red, yellow, and blue in flat water-colour washes. In each of these circles, colour overlaps and the result is :—

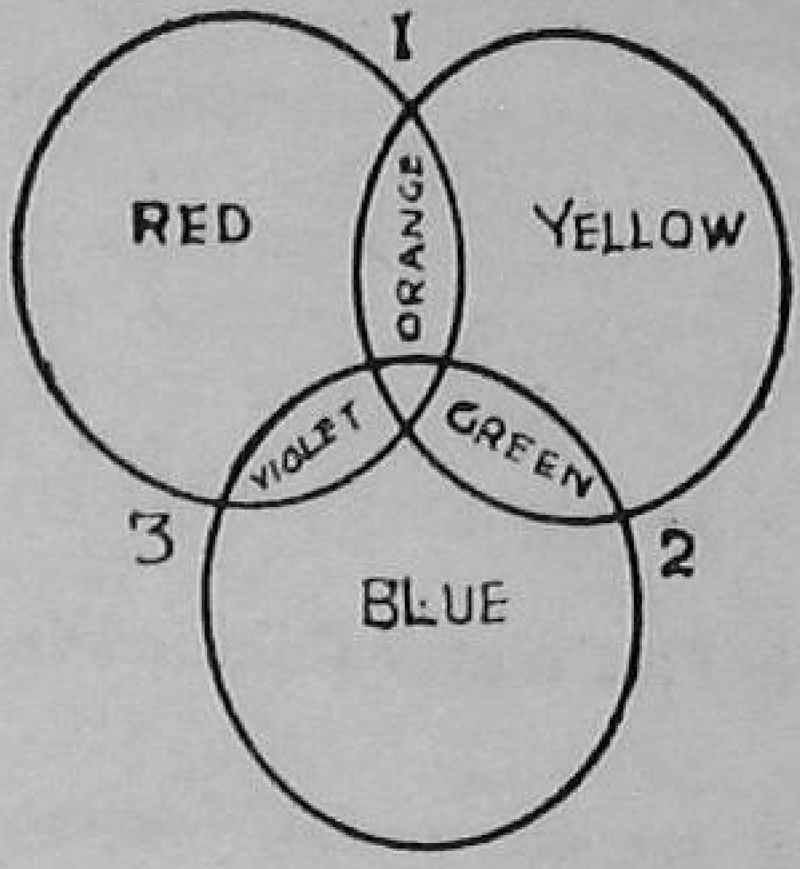


Fig A

Red over yellow makes orange as at (1)

Yellow over blue makes green as at (2).

Blue over red makes violet as at (3).

The resultant colours are called secondaries and red, yellow and blue, the combinations which give us these are called primaries.

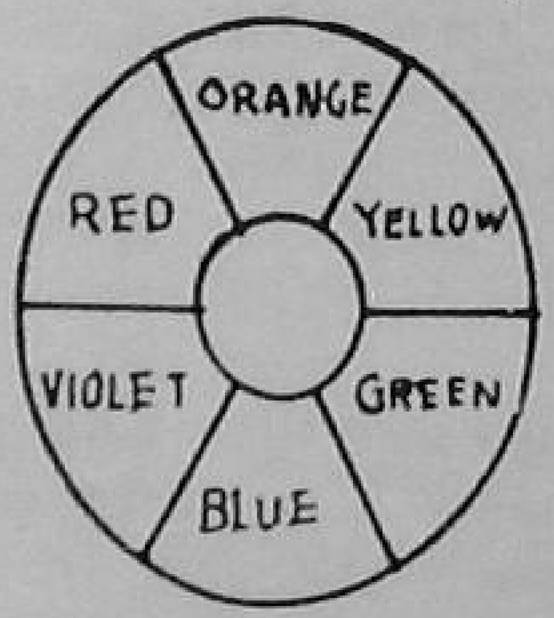


Fig. B

In the given figure (B) alternate spaces have been painted in red, yellow and blue.

If these colours are mixed with the other and the blank alternate spaces are filled with the mixture so formed, the resultant colours would be the same as above, viz. orange, green and violet.

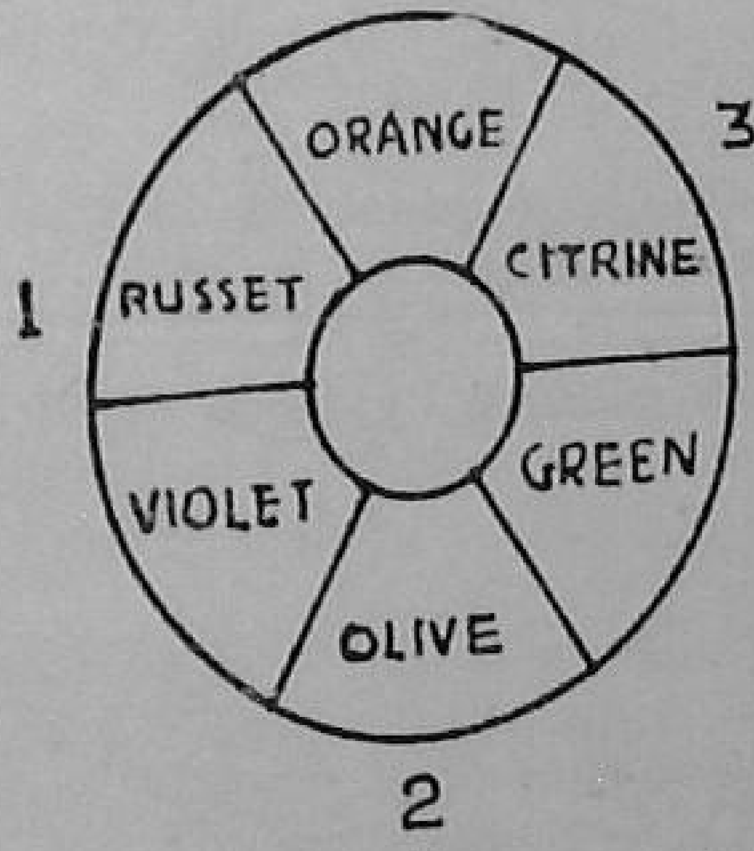


Fig. C

Again if the process is repeated in respect of the secondaries as shown in the figure (C), the resultant colours would be, russet, olive, citrine. They are called tertiaries as at 1, 2 and 3.

Plate of Colours for Senior Children.

Plate of colours for senior children will include the seven colours constituting a rainbow, viz. violet, indigo, green, yellow, orange, red. If white and blue are added, it will widen the range for various tints and shades.

Colour Matching and Mixing

Before painting an object from nature or otherwise, the colours may be matched on a separate piece of paper and held close to the object to see if it matches.

Colour matching exercises may be given in pattern designs.

The following points may be borne in mind in so far as work in water colour is concerned.

1. Always mix a deeper colour with the lighter one. For instance to get orange, put red into yellow, not yellow into red.

2. When painting any object in water colour, draw it very lightly in outline.

3. Mark the main effects of light and shade and corresponding colours. The high lights on the drawing may be left unpainted. If painted at all, it should be done in the lightest tint.

4. Try to paint the whole of a given space while the colour is wet.

Exercise in Flat Water Colour Washes.

As already said, good results in water colour can only be expected from experts, exercises in flat washes are essential.

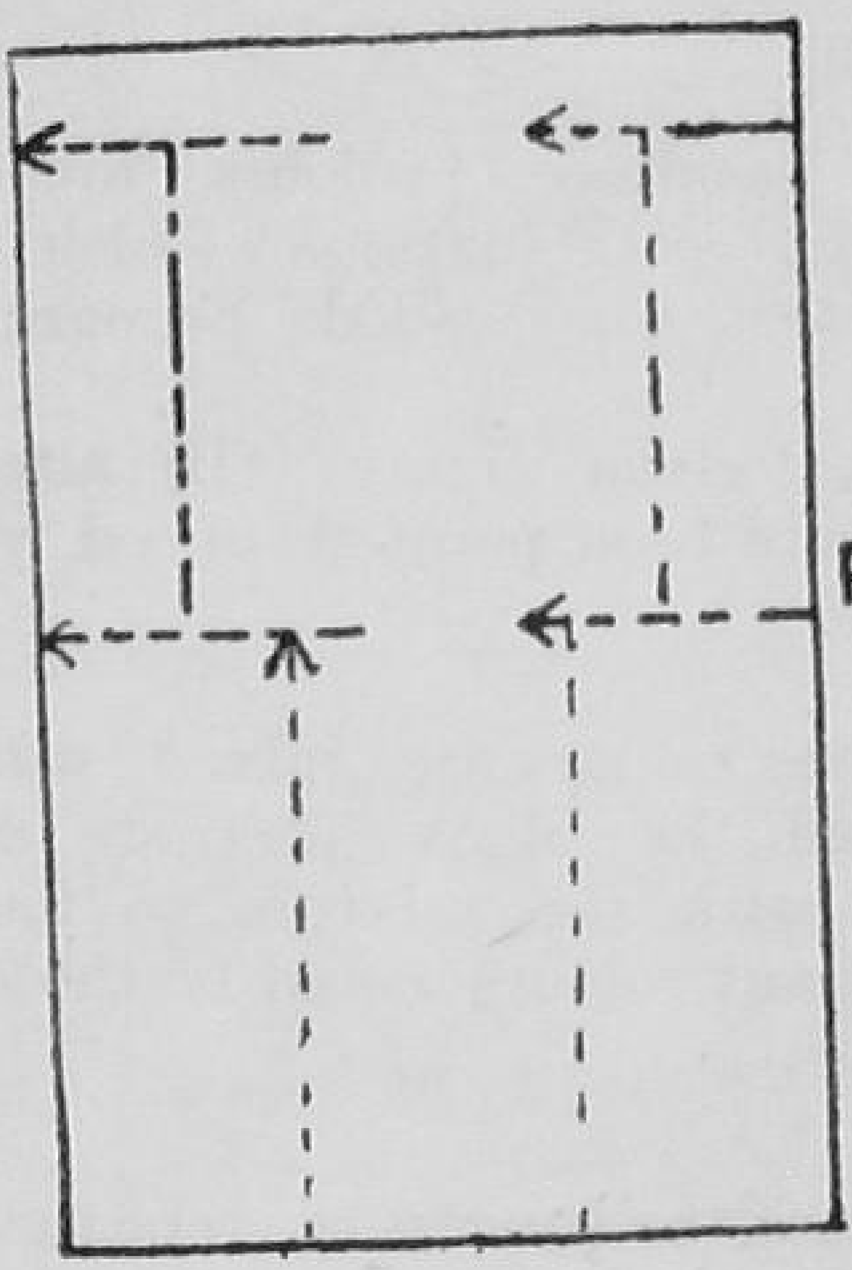


Fig. D

Let the child draw a rectangle or a square upon the paper, say, 3" by 5"; place the sheet of paper in a slanting position to make the colour flow downwards.

Fill your brush with colour and paint from the left hand corner at the top. Paint the colour along the edge at the top with the brush. Then paint with the strokes of your brush downwards. Always move from left to right and back again as in Fig. (D), make sure that your brush contains always plenty of colour.

Flowing out of the colour at the edges should be avoided lest the painting be spoiled.

While painting in water colour, the strokes of the brush make a sort of row. See that one such row is not dried up before the other is painted. Otherwise the colour while overlapping will give rise to a dark line.

Retouching should be avoided so that an even tone can be produced.

Flat washes of ornamental forms, maps, geographical diagrams, etc. will provide further exercise.

Colour should be mixed well and kept stirred while working.

Distemper (Body Colour) Preferable for Small Children

We shall now consider if a child should work in water colour or distemper.

Work in water colour can be more profitably made use of by experts than amateurs and is difficult to be handled by children. We cannot reasonably expect to educate their colour sense through this medium. Design and this medium go ill-together. It does not suit design or a decorative piece of work. It can show its true colours on white paper only. It is also very expensive for use by children.

Quite the opposite is true of distemper. Brilliant colours as also other tints and shades can well be produced on any coloured or white surface. Bigger or smaller surfaces of various shapes can be covered very flat and with ease. Patchiness can be avoided when alternations are made. Any colour can be coated on any other colour because of its opaque nature.

Moreover, a child can derive more benefit, if given exercises in colour combination on pattern design than by the imitation of coloured surfaces.

This medium is also economic.

NATURE STUDY

Reasons for Teaching

All our ideas of beauty are derived from Nature. Nature is infinitely suggestive and inspiring in terms of beautiful forms and attractive colours. Its study develops the power of observation, and precision and a sense of proportion.

Nature study should be intelligently applied to the art of practical value. It should be related to the art of decoration. It may be suggested that Nature Study, Nature Drawing and design should form one single unit.

Some Principles of Beauty in Nature Study.

Nature affords full scope for the appreciation of the principles of beauty.

A few of these principles are :

Repetition. This is seen in the curves of mountains, in the shape of clouds, in the form of trees, flowers and leaves etc.

Alternation and contrast. This principle of beauty is found in flowers like the daffodil, with its long arrow-like leaves ; the rose, with its smooth petals and sharp thorns, etc. Every beautiful object owes some of its beauty to this principle. Practical application of this principle can be made in ornamental designs by placing two different shapes alternately.

Symmetry and Balance. Although many natural forms—human, animal and certain plants—are symmetrical, many other forms such as mountains, trees, etc. are not so. However, balance is present in every form. This is the most important single principle in art. The practical application of these principles will be dealt with in the chapter on "designs"

Observation will grow.

The most abiding benefit that a child derives from the study of nature is the growth of his power of observation. A blade of grass, an

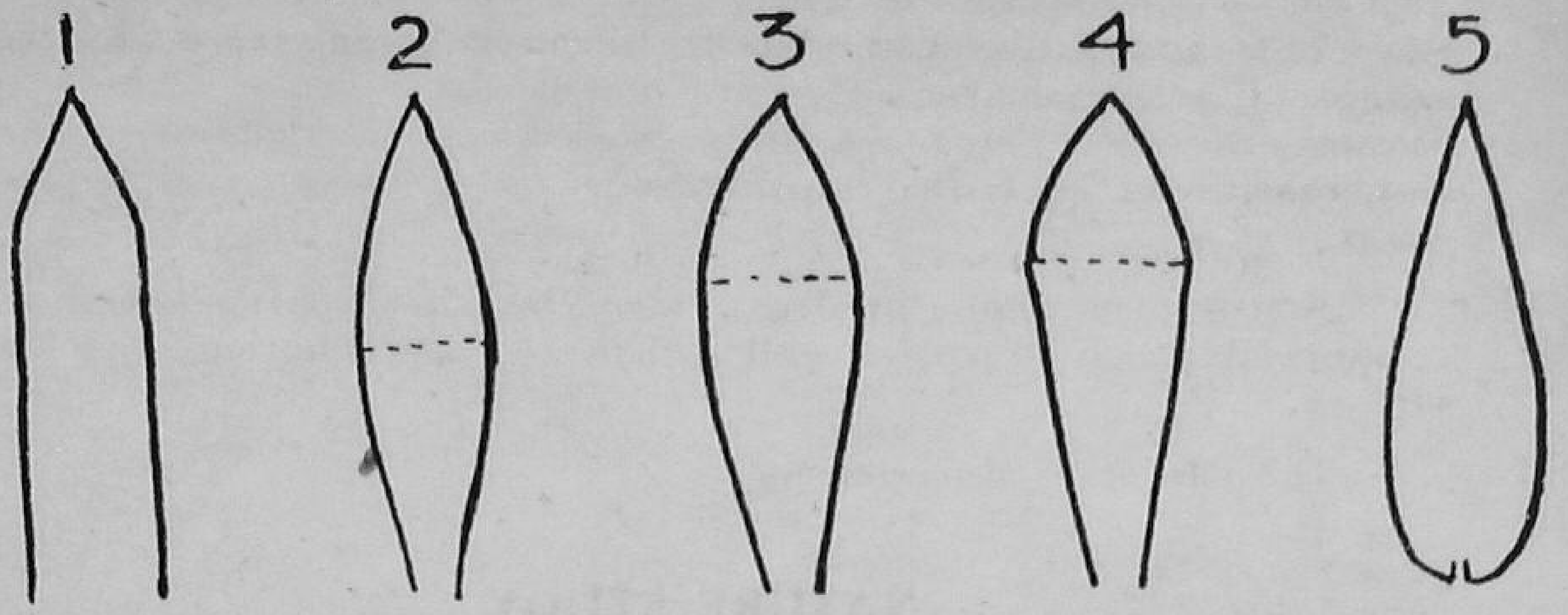


Fig. (A)

insignificant weed or a tiny circular flower, that ordinarily remain unnoticed by us afford ample scope to a child for observation of variety in form and colour.

Five different forms of blade are given at Fig. (A)—(1) Two lines, that are parallel, pointed at the apex. (2) Two simple curves meeting at the top with a maximum width at the centre. (3) Same as (2) with the addition that the maximum width is not at the centre but a little higher and the form is broader. (4) Formed by two oblique lines with the maximum width at its $\frac{1}{4}$ from the top, from where it meets at the apex with a slight curvature. (5) Starting with two round curves at the base that converge to a point in straight lines.

Methods of Teaching.

When we see an object and touch it, the idea of its form and size is gained. Every child should, therefore, be given the natural object he has to draw, such as a leaf, a flower or a fruit. If for some reason this cannot be done, at least the object should be placed just in front of the child and very close to him. A lump of wet clay may serve as a flower holder. If it is required to make the drawing of a flower from a flower pot, a group of four or five children should sit round the pot or in its front as the position may be.

Questions on colour, form, growth, uses etc. of the object to be drawn may be put before the drawing begins. In fact the children may be asked to say all they know about the object. After hearing from children, the teacher should apply additional information, if necessary, to arouse their interest.

While the lesson is in progress, each child should be attended to individually, the teacher pointing out errors and correcting them. Common mistakes may be explained as also the fundamentals to the whole class on the blackboard.

Lessons may be graded according to their order of difficulty, or a child may lose both interest and self-confidence. He will lose interest if he finds the lesson too easy and self-confidence if he finds it too difficult.

When a drawing is made, it may also be applied to designing. Each part of the plant such as leaves, stem, bud, flowers etc. may be studied

separately to equip the child with all its knowledge to be applied in designing.

Suggestive Subjects for Beginners.

The following lessons may prove useful for beginners :—

LEAVES :—Poplar, Betel, Lily and simple forms of fruit trees.

FLOWERS :—Tulip, Daisy, Sunflower, Lotus, Lily and Crocus etc.

FRUITS :—Apple, Mango, Orange, Lemon, Banana, Pear and Cherry etc.

VEGETABLES :—Carrot, Turnip, Melon, Raddish, Pumpkin, Brinjal etc.

Some other natural objects such as trees, grass leaves, mountains, sun, moon etc.

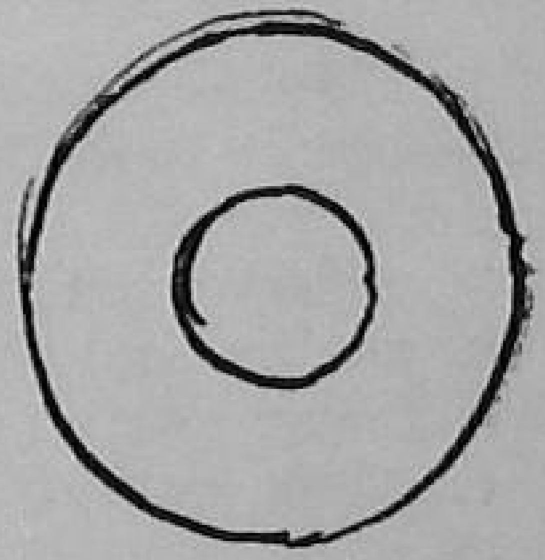
The choice of various natural forms suggested above is mainly based on their simplicity, boldness, availability.

A CIRCULAR FLOWER, SAY, A SUN-FLOWER.

Model Lesson No. 1

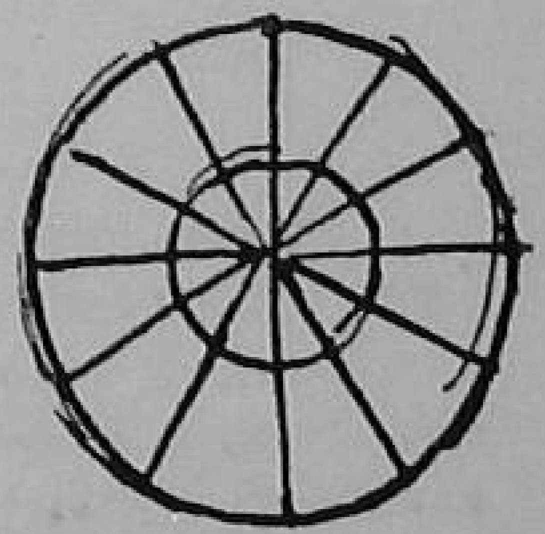
A carefully selected natural specimen may be so placed before the children that every child has a good view of the model. The structure of the flower and its beauty may be explained. The order in which it should be drawn may also be sketched on the blackboard as indicated.

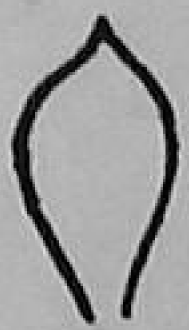
A



Draw two concentric circles approximately to the measurements of the natural flower, the outer one for petals and the inner one for seed vessels etc. as at (A). Divide the outer circle approximately into the required number of equal pa ts, say 12. Each part forms a petal. Join these division points to its centre, as at (B).

B

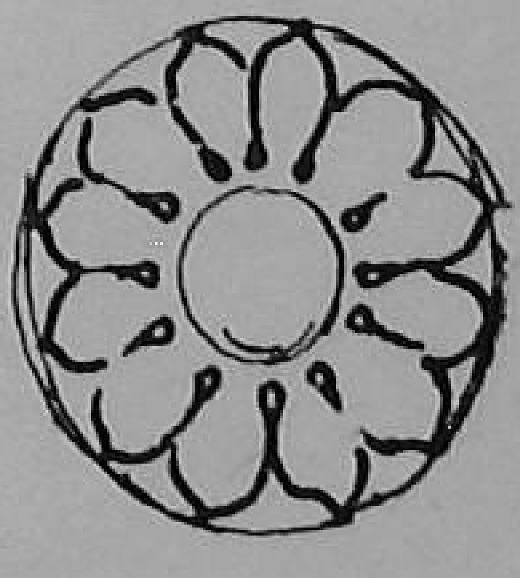




C

Study the petal of the flower as at (C).

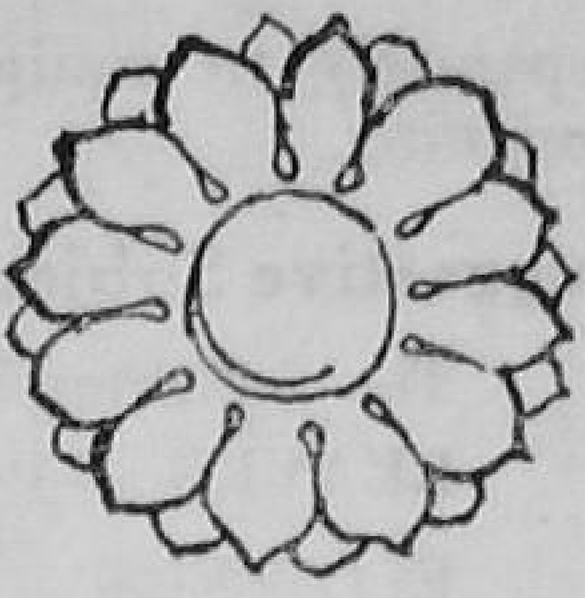
D



Fill in each part of the outer circle with one petal, as at (D).

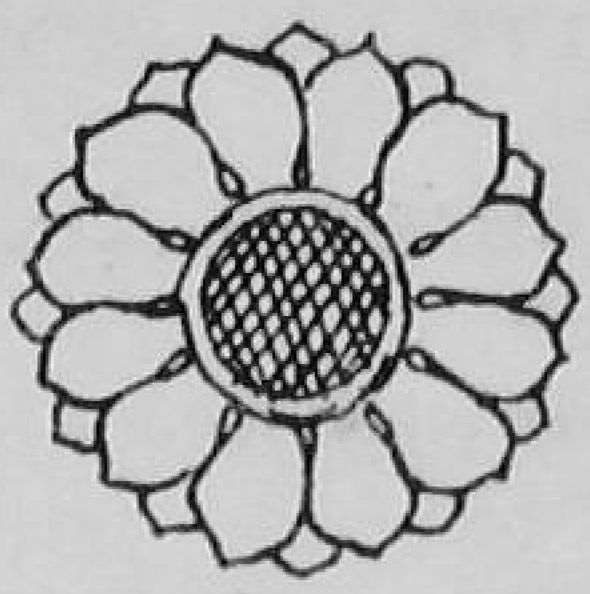
Between two petals draw a tip of the petal to represent another back row, as at (E).

E



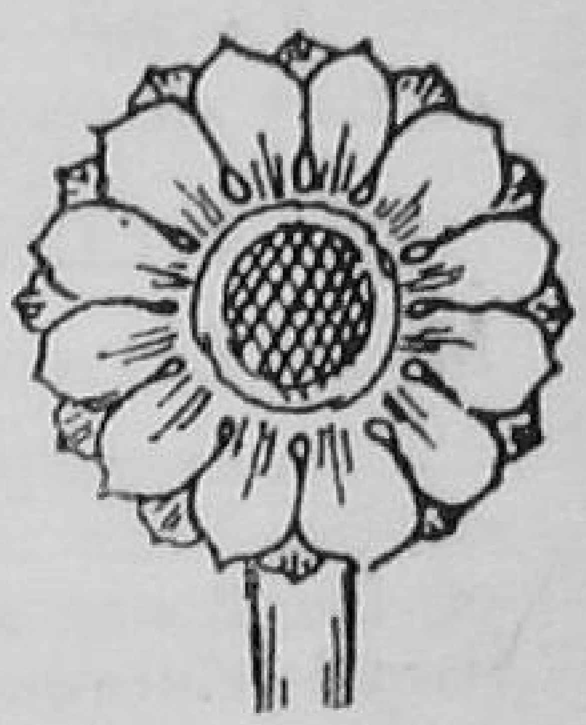
The inner circle may now be filled with crosswise lines to represent the seed vessels etc, as at (F).

F



For the stem take two parallel lines of the same thickness and direction as in the natural flower and complete the drawing as at (G).

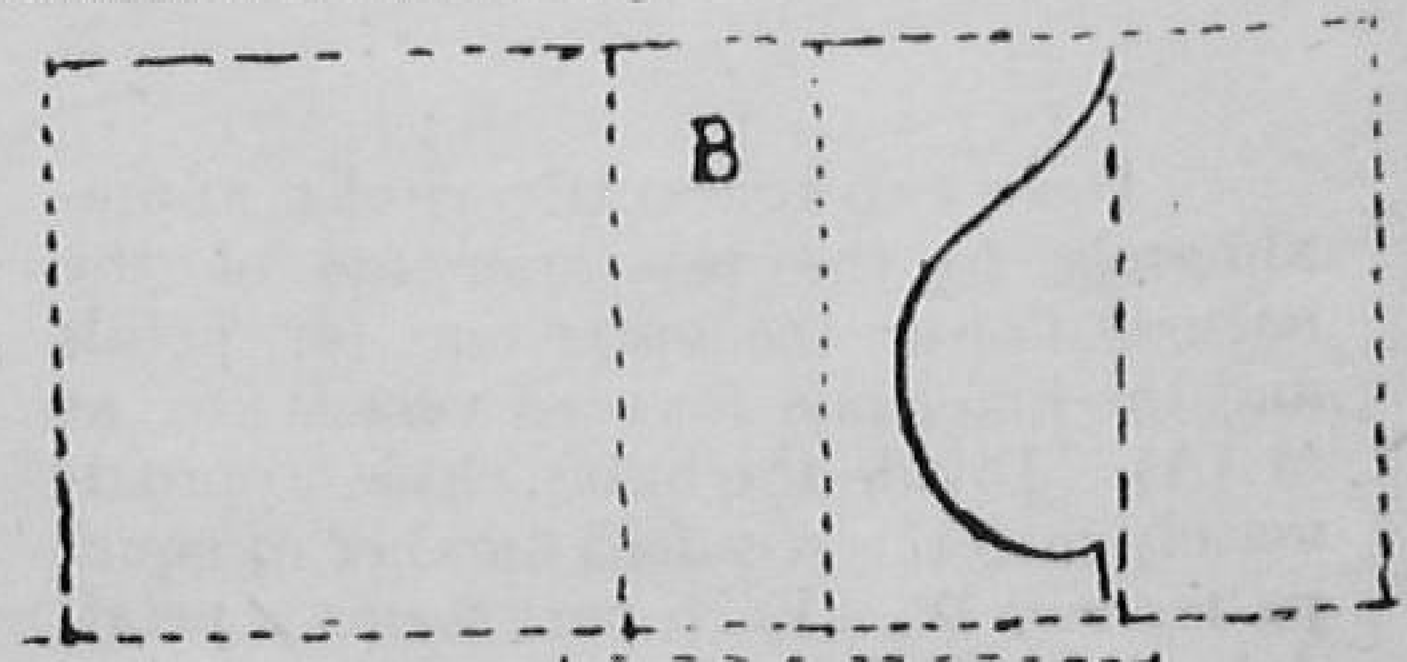
G



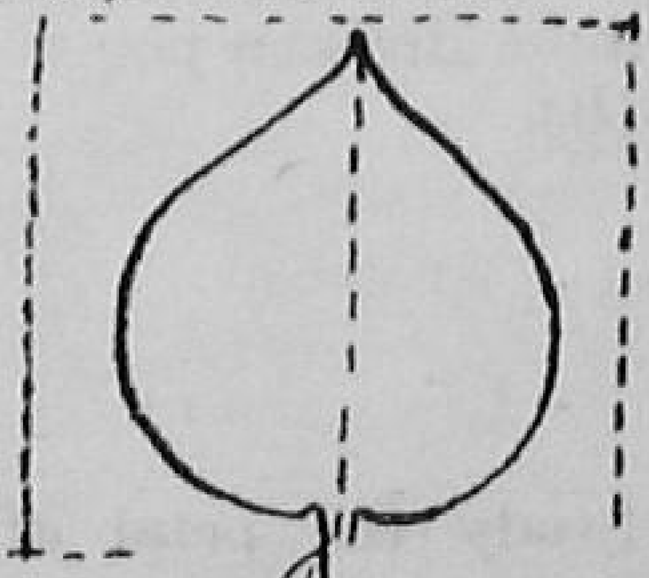
To draw the leaf, draw a rectangle or a square approximately the size in which the leaf can be enclosed as shown by the dotted lines at A.

Mark a central line in it as the mid-rib of the leaf and draw carefully the left half of the leaf as at B.

A

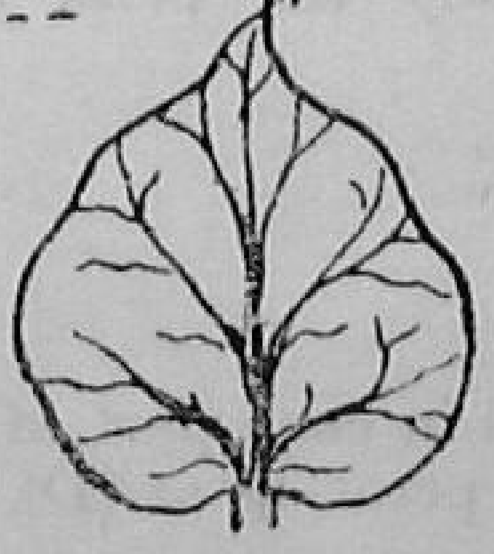


Again, draw another right half side almost symmetrical with the left one. Examine and correct carefully its contours as at C.



C

Fill in the central and smaller veins and finish the leaf form as at D.



D

Care should be taken that all the construction lines are drawn by hand and that no geometrical instrument is used. Never mind if there is some difficulty at the start. Constant and continued practice will make such drawings by children accurate.

Some Hints.

1. Minute details should not be required from small children in their drawings because they lack control over the smaller muscles of their hands and fingers.

2. Large drawings in chalk and c ayon *takhties* or small black-boards or upon tinted paper are suitable at this stage.

3. Lessons should be short and simple. Children may be encouraged to bring their own specimens for drawing and should learn the names of the l aves, flowers, plants and trees.

4. When the drawing is complete, some children like to paint it, others take pleasure in cutting it with a pair of scissors and pasting it on coloured paper.

5. It is often found that a child is delighted to mark a pencil line around a leaf or any other flat object upon the paper for its correct representation. Such a habit in small children should not be discouraged. It will help them to memorise its form.

6. After each exercise in nature study, its application in designing may be made.

BORDER-DESIGN

APPLICATION OF NATURE STUDY (LESSON 1) TO DESIGN.

Model Lesson II.

Six g aded exercises of simple bo der-designs are given by way of illustration of what can be done by children.

Mark two parallel lines, say about $1\frac{1}{2}''$ apart to form a border.

Exercise 1. Divide it into any number of equal squares or rectangles, say, seven. Fill in each division with the flower; this will form a border design, as at Fig. (A).

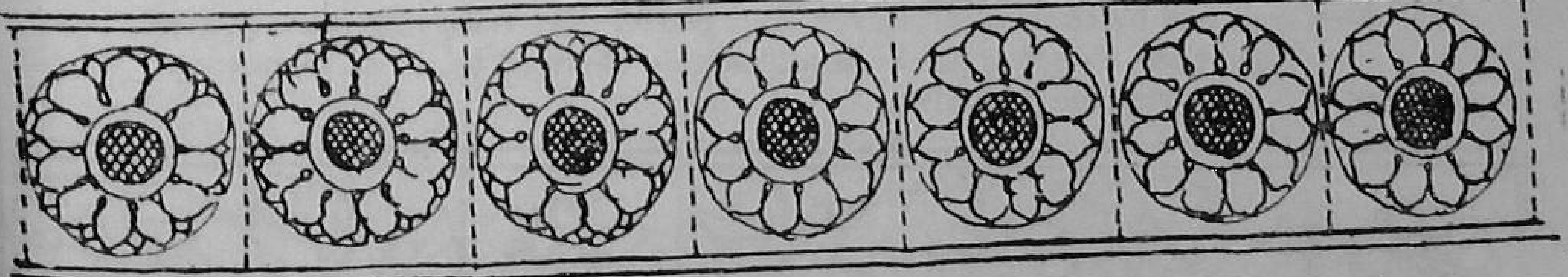


Fig. A

Exercise 2.

The same design can be elaborated if the same but smaller half flowers be added at the corners of the first unit. These smaller ones will combine with other adjacent ones when repeated and thus make full shapes, as at Fig. (B).

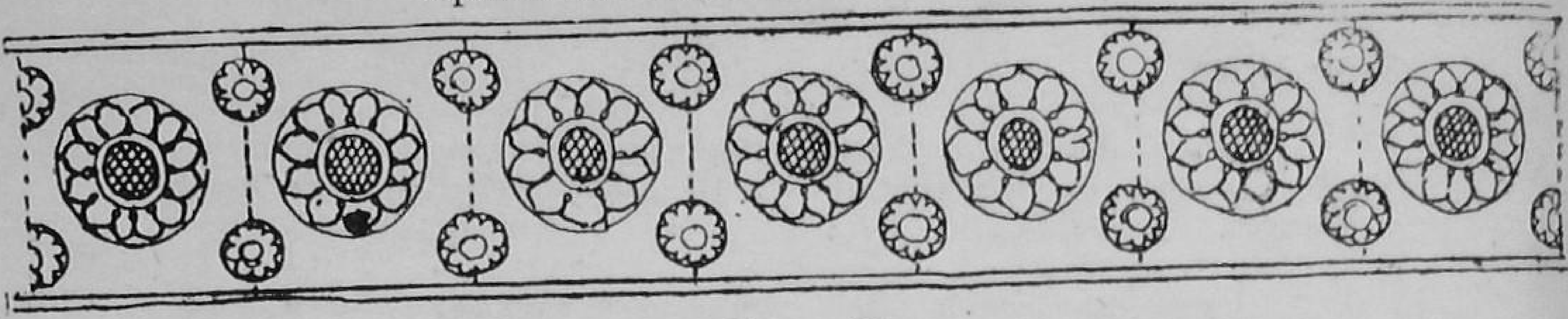


Fig. B

Exercise 3.

If the same border needs to be converted into an allover pattern, place the same small one-quarter flower at each corner as before. By the repetition of the unit in all directions these one-quarter small flowers will again combine to form a full shape, as at Fig. (C)

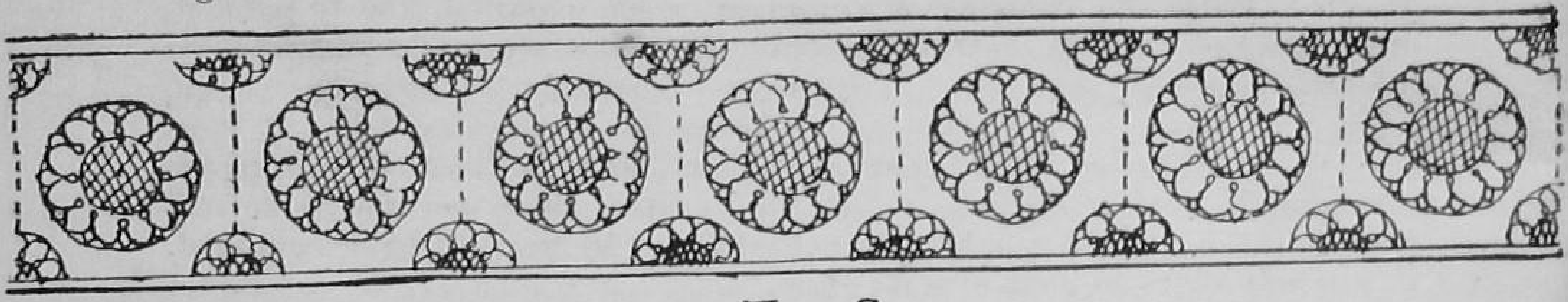


Fig. C

Exercise 4.

Prepare a border as in exercise No. 1. Fill in the alternate spaces with the flower. Join these by a curved stem line (meander) as shown. Draw double line of the meander. Fill in the other empty spaces with the leaf form and join with meander and the design is complete, as at Fig. D.

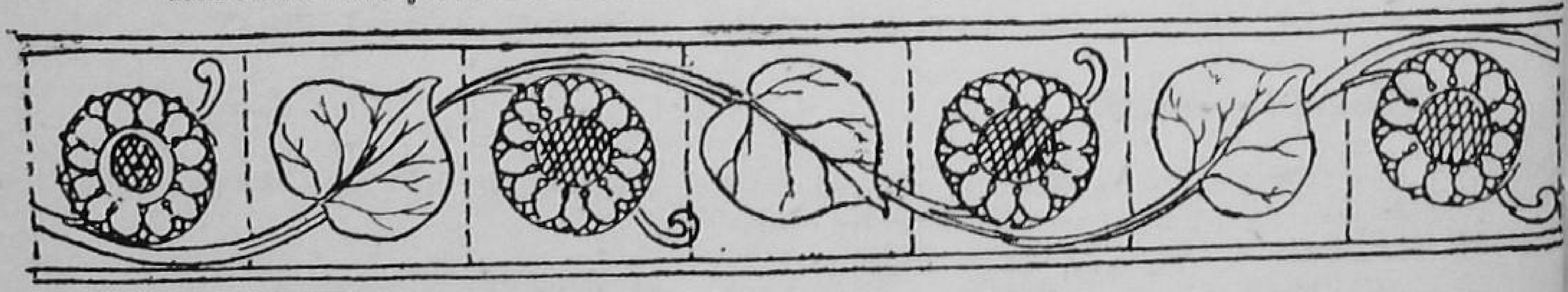
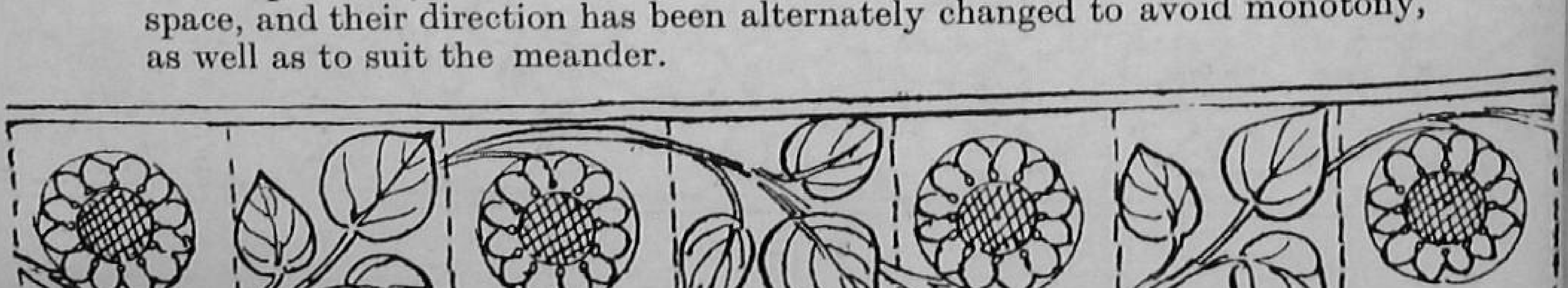


Fig. D

Exercise 5.

A variety of such patterns may be produced in such borders with same motif. In the border at (E) the mass leaf form of figure (D) has been replaced by three small leaves, and placed diagonally in the square space, and their direction has been alternately changed to avoid monotony, as well as to suit the meander.



Exercise 6.

In the design at Fig. (F) is the same arrangement as at E. Only the diagonal direction of the leaf form has been changed into upright positions. It gives a steady effect to the border while at E it looks as if the leaf were in motion.

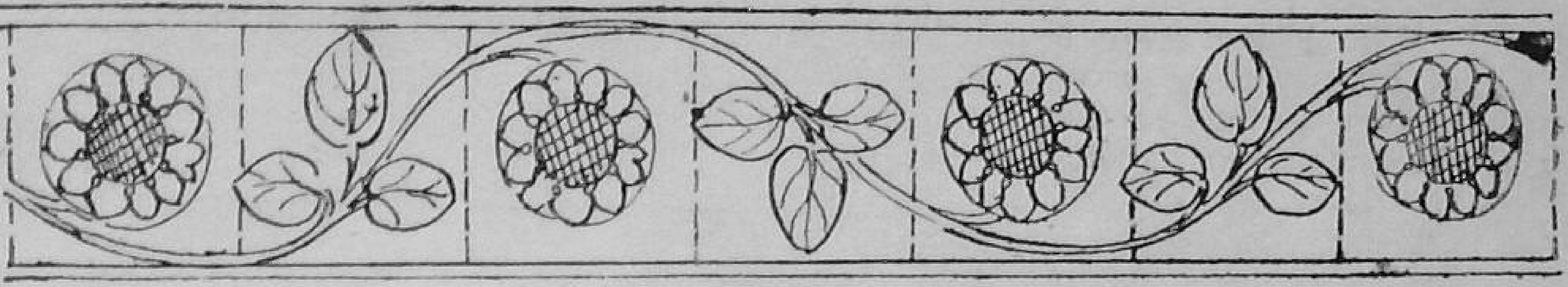


Fig. F

Such borders should always be enclosed by thick marginal lines at the top and bottom to enhance the beauty effect. These running borders can be extended to any length and can also be used as frames and margins.

Practical Application of Design

When a child prepares his design he may apply it to the decoration of his things, such as handkerchiefs and other apparel.

Suggestive Lessons for Senior Children

Lessons may gradually be made more difficult according to the age and development of the child. More difficult natural objects including various shaped flowers, compound curved leaves, the serrations of leaves, junctions of stalks and simple composition may be practised as the child gains in maturity.

The following lessons may be found useful.

Flowers :—Bell shaped—Wild rose, Garden rose, Dahlia, Violet, Pansy, Daffodil, Pink, Iris, Convolvulus etc.

Leaves :—Various creepers,—Vine, Chrysanthemum, Chinar, Geranium etc.

Fruits :—Cherries, Grapes, Tomatoes, etc.

In addition to these forms, out-door sketching of trees, mountains, clouds, may also be practised.

A Bunch of Grapes (Fig. A)

Drawing of more difficult Natural Forms

MODEL LESSON NO : 3

It must always be remembered that the subject is within the clear view of every child. Place a sheet of white paper in its background to give a fair contrast, so that leaves, grapes, stalks, joints and other details would look clear.

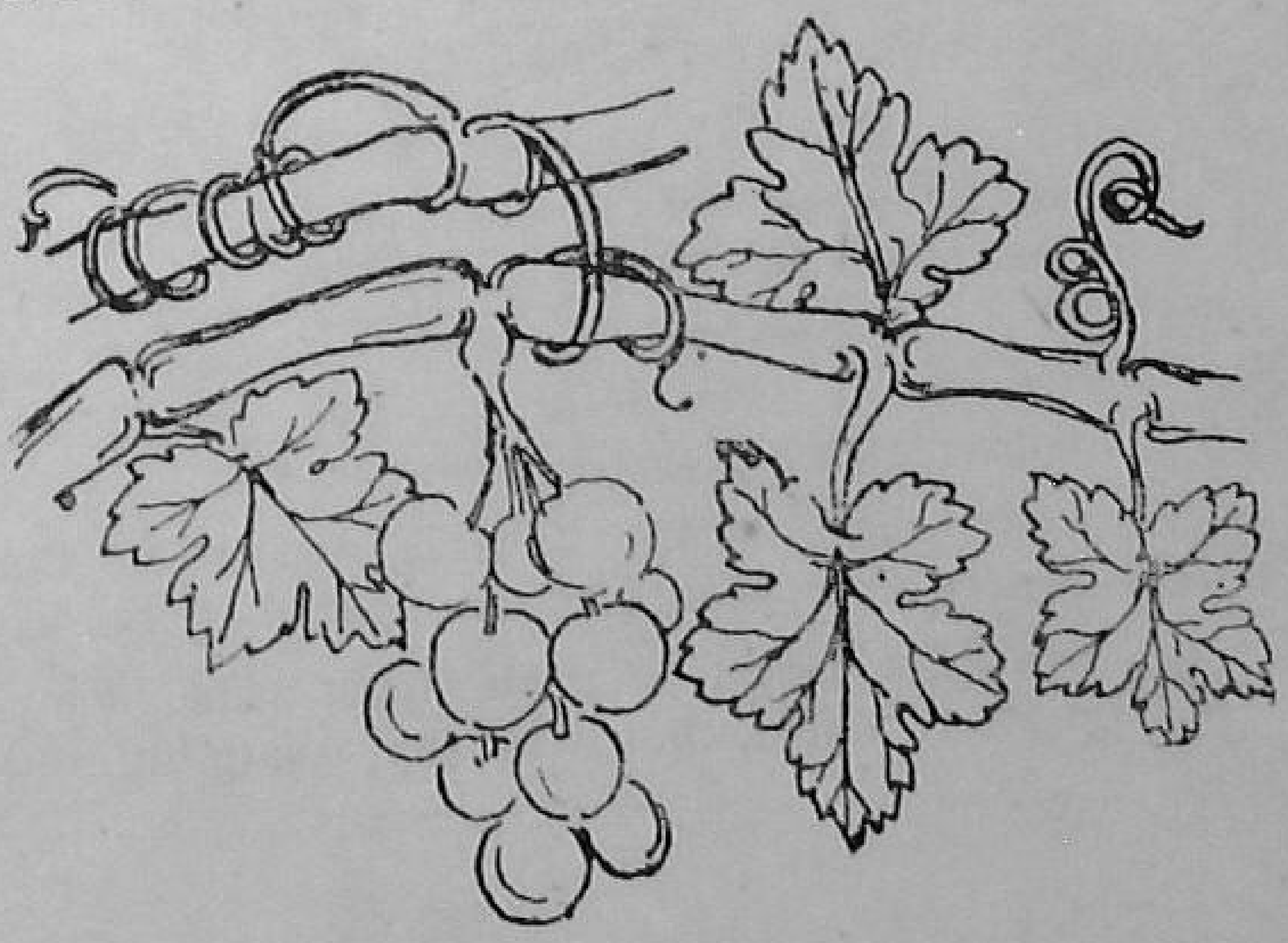
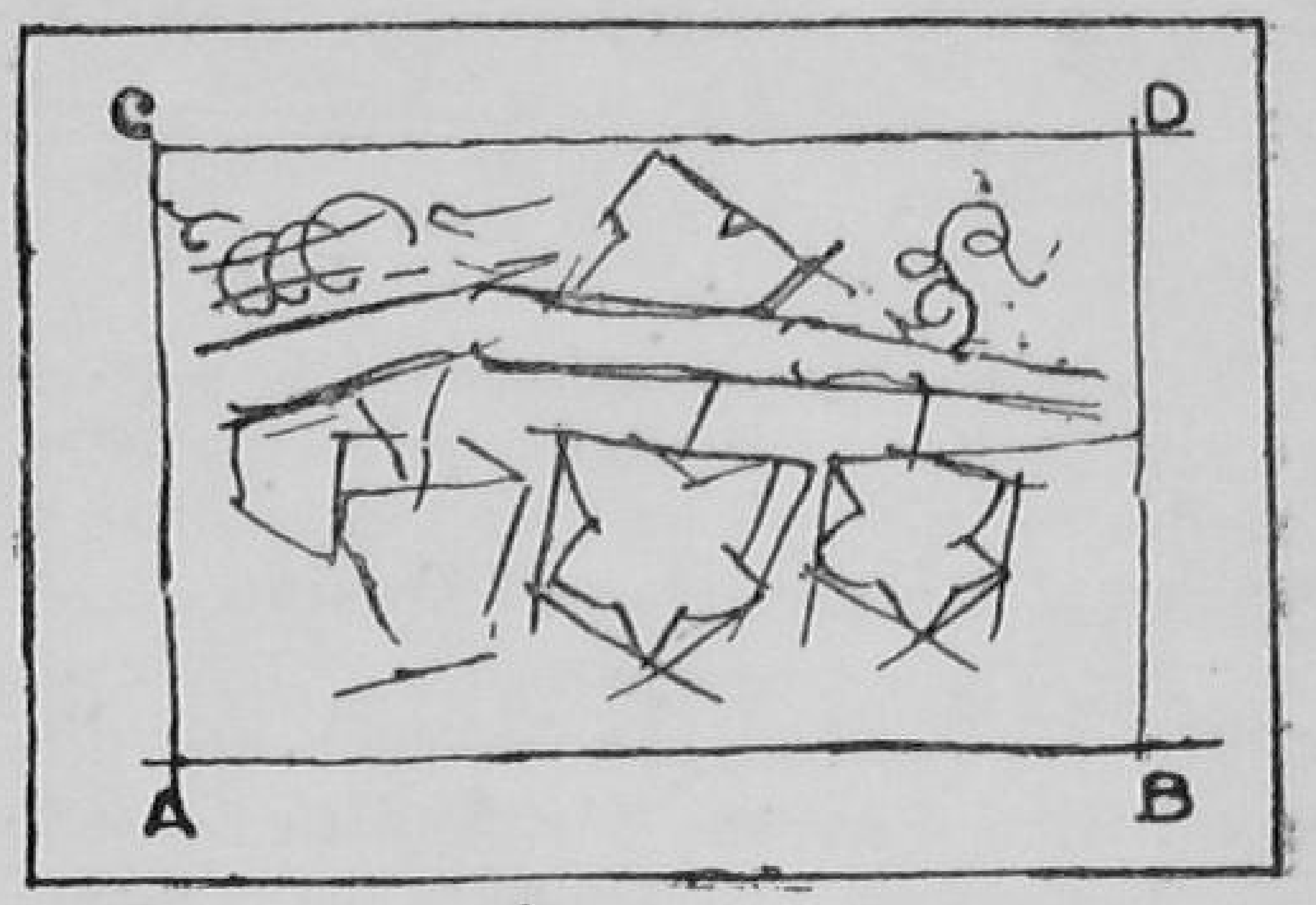


Fig. A

Before allowing the children to work, the teacher should explain to the class the composition and setting of their drawings artistically upon their papers. In this case children should be asked to place their paper or exercise book horizontally as at Fig. B because the overall length of the subject is greater than its overall width.

The children should be asked to leave some space all round the edges of the paper, to serve as a suitable border, so that the drawing may look well balanced. Lines AB, BD, DC and CA may be marked as at Fig. B, to enclose the drawing within the space.

Fig. B



Once the teacher has explained all about composition and proportion the children may begin to draw. They should be asked to set out the general Plan by very safe single lines, and sketch the general. mass forms as shown by their lines in the Fig. B. The teacher now may make a round and see the planning of every individual child and give him all possible instructions regarding the composition.

When the teacher is satisfied with the planning and the massing of all the forms in respect of the correct proportion, size etc., he should ask the children to proceed.

When the work is completed, the teacher needs again to make another round and pay every child individual attention by pointing out his mistakes separately on the same paper, and complete the lesson, as shown at Fig. (C); its application to design has been shown in the lesson No. 4.

A few Instructions to bear in mind

1. Serration and junction of leaves and stalks are quite different to different plants and should be very closely studied and then drawn.
2. The size of the drawing should be about the actual size, if space permits, otherwise, smaller.
3. Silhouetting may be done by painting the drawing with black ink ; the veins of the leaves and the edges of overlapping leaves and petals etc. should be left white.
4. Finished drawings may also be pointed with flat water colour washes in their local colours, and then out-lined in deeper colour with a pointed brush or a pen.
5. Accentuation of the lines is needed in finishing, that is, the nearer edges should be represented by bolder (thick) lines.
6. Drawings should be made from whole to parts and not from parts to whole, that is to say, planning out and arranging of

masses should be done before inserting detail.

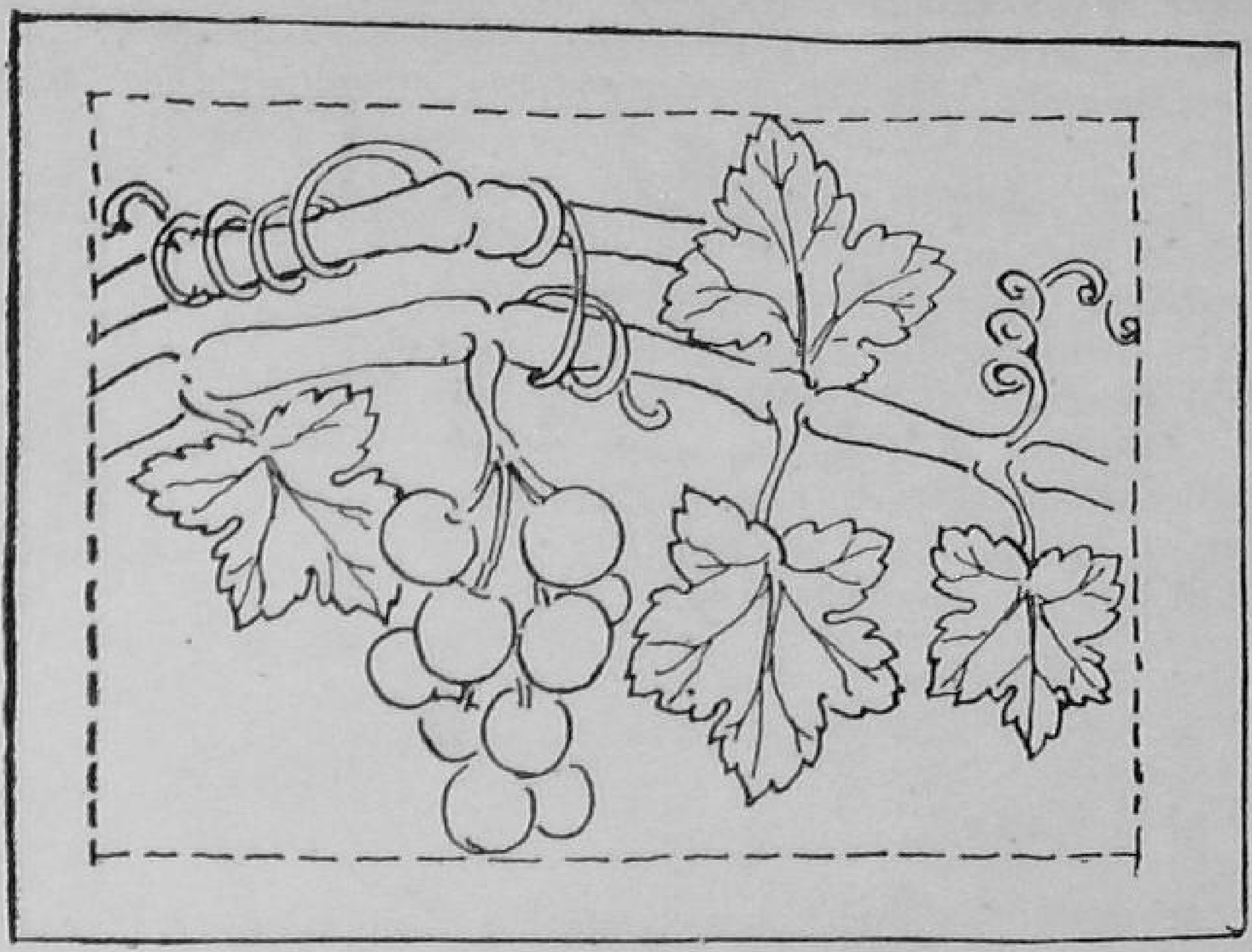


Fig. C.

MODEL LESSON NO. 4 PANEL DESIGNS

The following panel design is based on the previous Nature Study, lesson No : 3 (VINE).

The children may be asked to set a panel according to their choice in size, say a rectangle of 4" by 6" and divide it vertically by marking a central line. Then the meander line on the left half may be drawn. Having arrived at a satisfactory system of meander, the general shape of the bunches of grapes (fruit) should be set out ; for example, one principal bunch can be suitably placed at the top and two subsidiary bunches a little below as at Fig. (A).

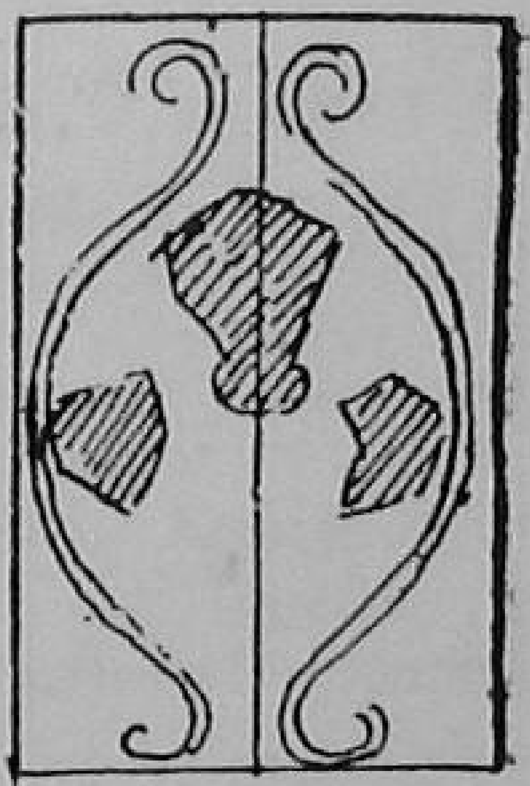


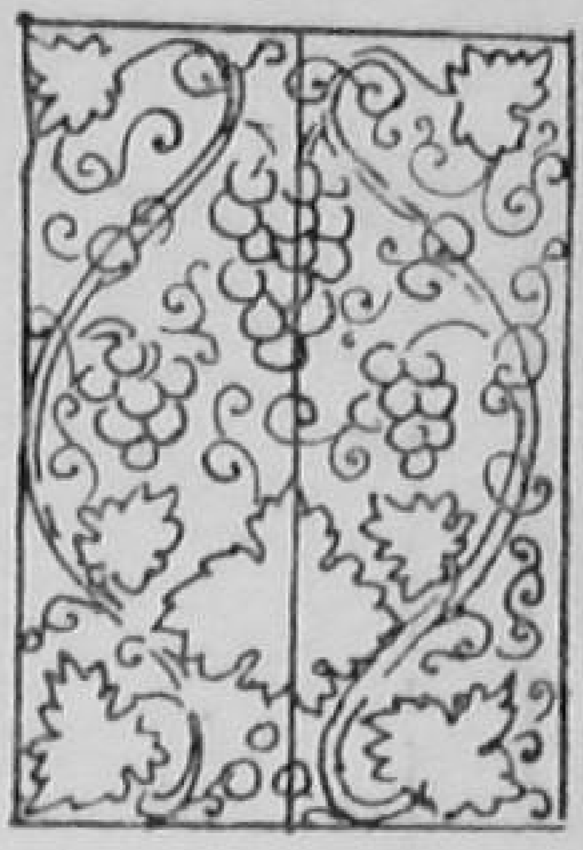
Fig. A

Then the leaves should be set out, for instance, a large one at the base and two smaller ones immediately above it. If we correct these by a system of stalk formation, we find considerable space unfilled and the stalks unduly prominent as at Fig. (B).

Fig B.

Therefore these long lines should be taken by twining the tendril around them and at the same time filling the intervening spaces with an ornamental design of somewhat lighter character as at Fig. (C).

Fig. C.



The above method of setting out a panel design, though simple, yet illustrates the method applicable to all symmetrical panels. The disposition of masses, either in colour or form will depend upon the taste and judgement of the child. The general rule, however, is to have a principal mass which will hold the attention and one, two or three subsidiary masses. The general principle of even distribution is at the same time observed.

DESIGN.

Design : What It Means ?

Design in art education implies ornamentation (decoration) of a certain object so that its appearance may become more beautiful and attractive.

Need of Design

Design forms an important feature in the development of the arts, industries and commerce of a country.

Elements of Design

The use of design in household articles makes them look beautiful. Articles of stationary, toys, clothes, toilet, crockery, etc. are all decorated and made more attractive; design is therefore applied to all industries these days.

As for the preparation of any article, we need some basic material, so we must have some material for design. This material is called an element. The elements of design are :—

1. Geometrical forms 2. Plant forms 3. Animal and human forms. 4. Organic forms.

Man started designing by combining dots, straight and curved lines. It developed with the advent of civilisation and plant forms came into use. Human, animal and other organic forms were gradually introduced and adapted to designing according to the tastes and traditions of peoples.

Principles of Design

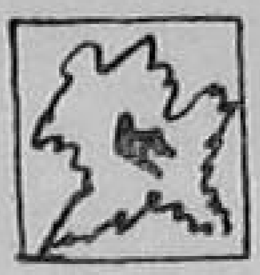
For designing there is a certain principle. Design has a certain order, rhythm and system. Some of the important principles of designing are 1. Repitition 2. Alternation 3. Symmetry 4. Balance.

1. Repetition means to repeat one unit (motif) throughout the surface. This sort of designing is attractive and simple to construct, and can very easily be done by children.

Exercise 1. REPETITION

Give a quarter sheet of paper to a child and ask him to fold it vertically and then horizontally. It will thus be divided into four equal parts.

Repeat the process and the paper will be divided into sixteen equal parts. Let the child fill in the first part with any shape or symbol just as he chooses as at (1). Then ask him to repeat the unit in the remaining 15 divisions. This will form a pleasant pattern as at Fig. A



1

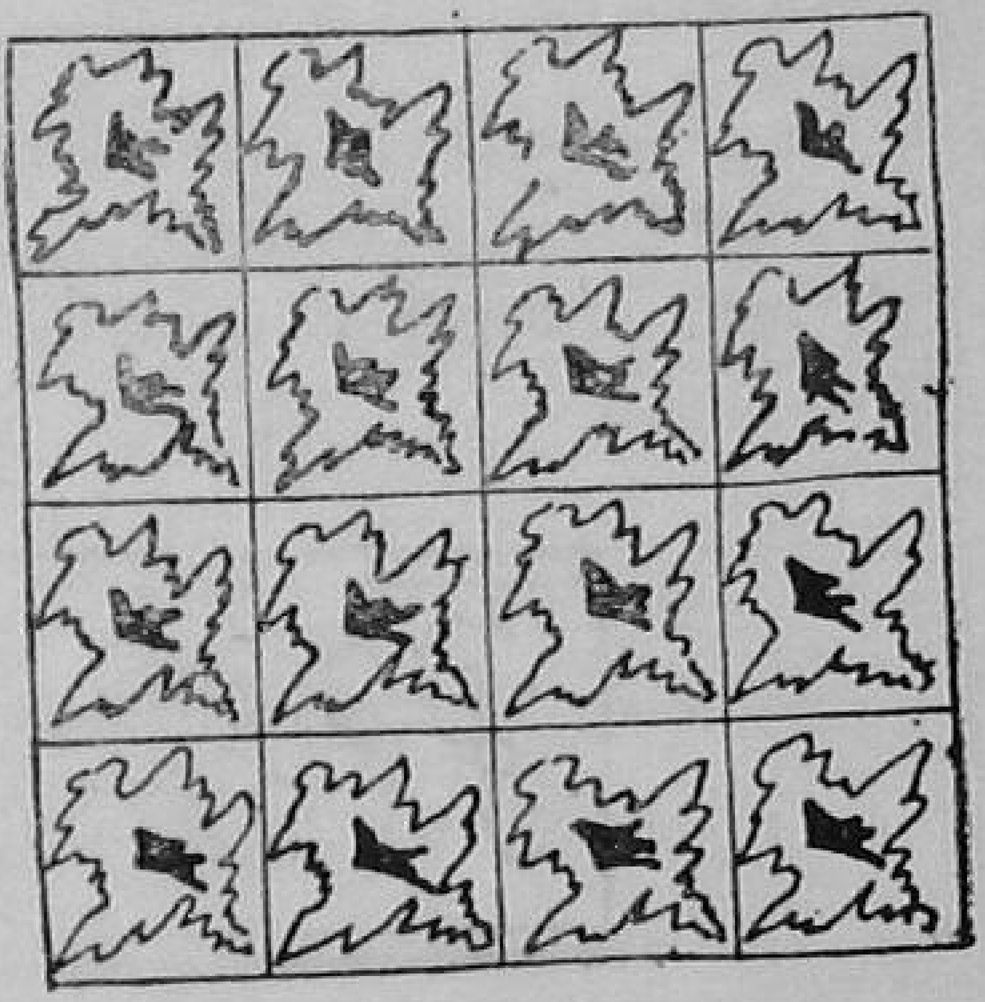
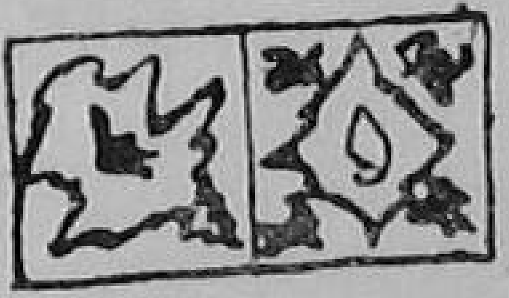


Fig. A

Exercise 2. ALTERNATION

Although this type of design is very simple to co struct and pleasing in effect, it produces a monotonous view all over the surface.

To avoid this, change is introduced. This can be done by alternately substituting another motif. Let us take an illustration.

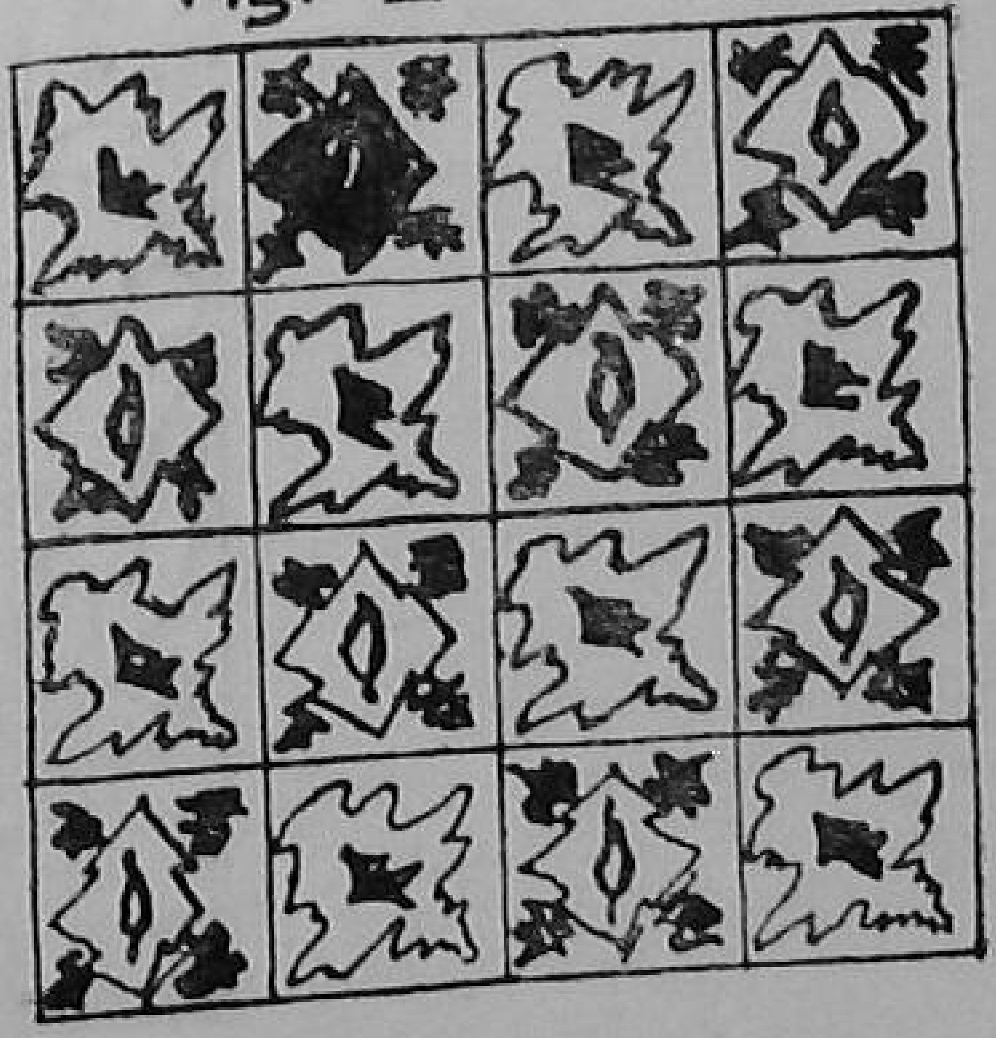


2

Ask the child to draw two parallel lines at some distance apart to form a border. Divide it into squares, or equal rectangles. Let every other square or rectangle, as the case may be, be filled in with one motif and the remaining ones with another motif. The design will be complete as at (2).

For a pattern design repeat the process and complete the design, as at Fig. (B).

Fig. B

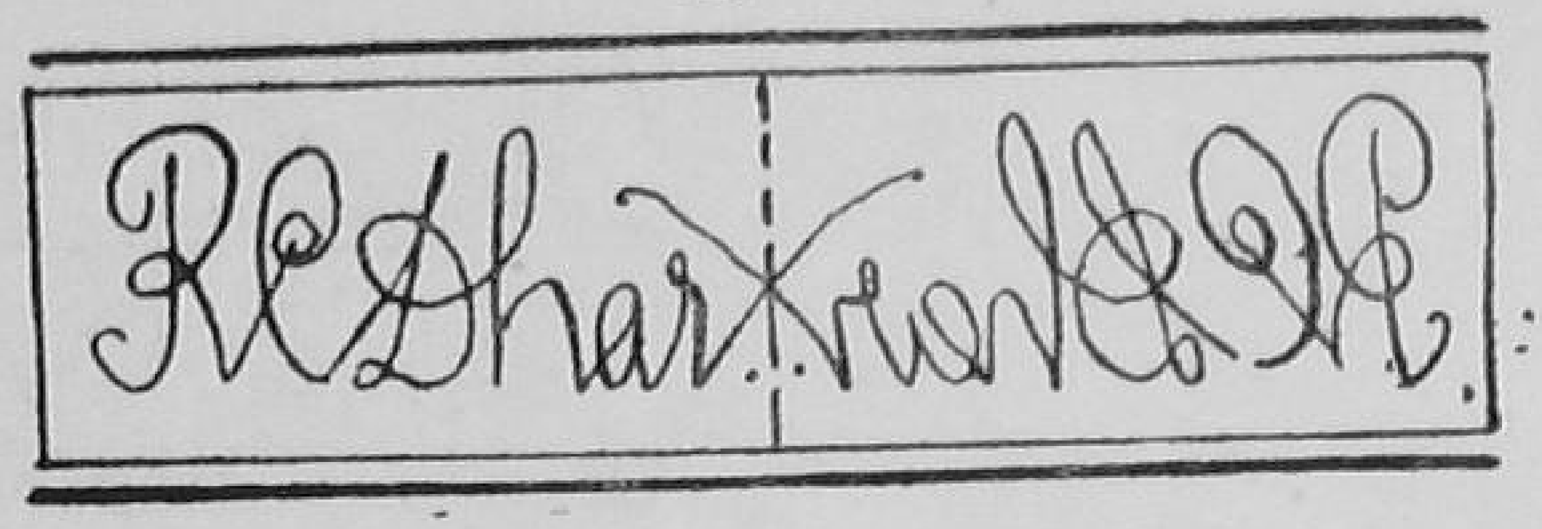


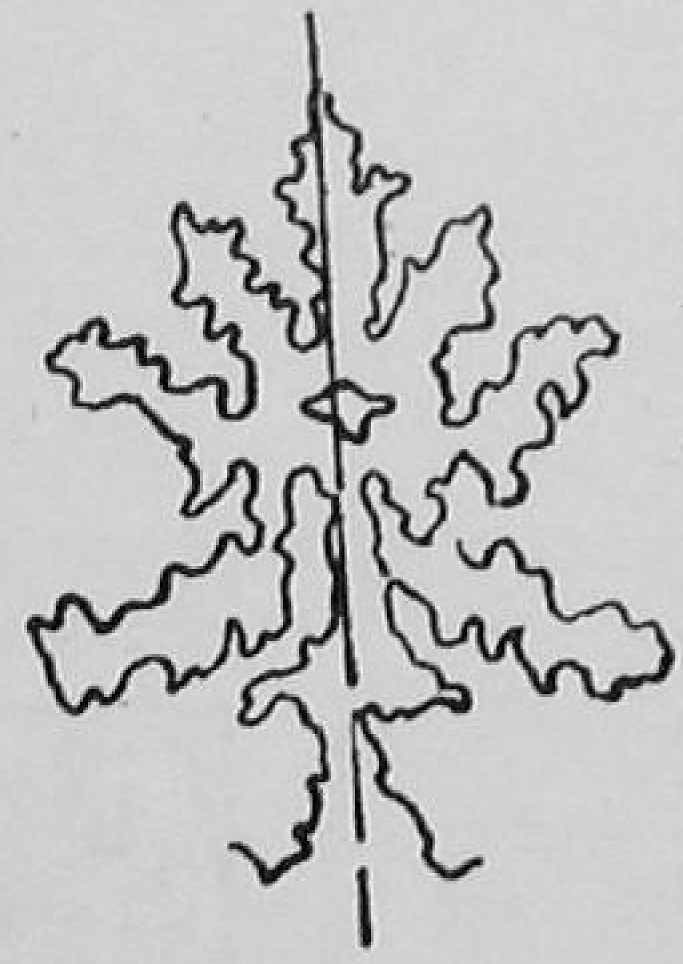
Exercise 3
SYMMETRY

Symmetry in itself makes a design. Symmetry imparts beauty. So a child likes symmetry in design. When he is signing his name or playing with ink and pen in scribbles, a child folds the paper. When ink is wet this doubles the mark of the name or the scribble or whatever it may be. By this process the impression of the ink falls on the other side of the paper shown at (3) & (4).

Let a border, panel or any surface be divided into two equal parts by a vertical line. Fill in the left half with any pattern and turn it to the right half. Thus the design will be complete as at Fig. (C).

3





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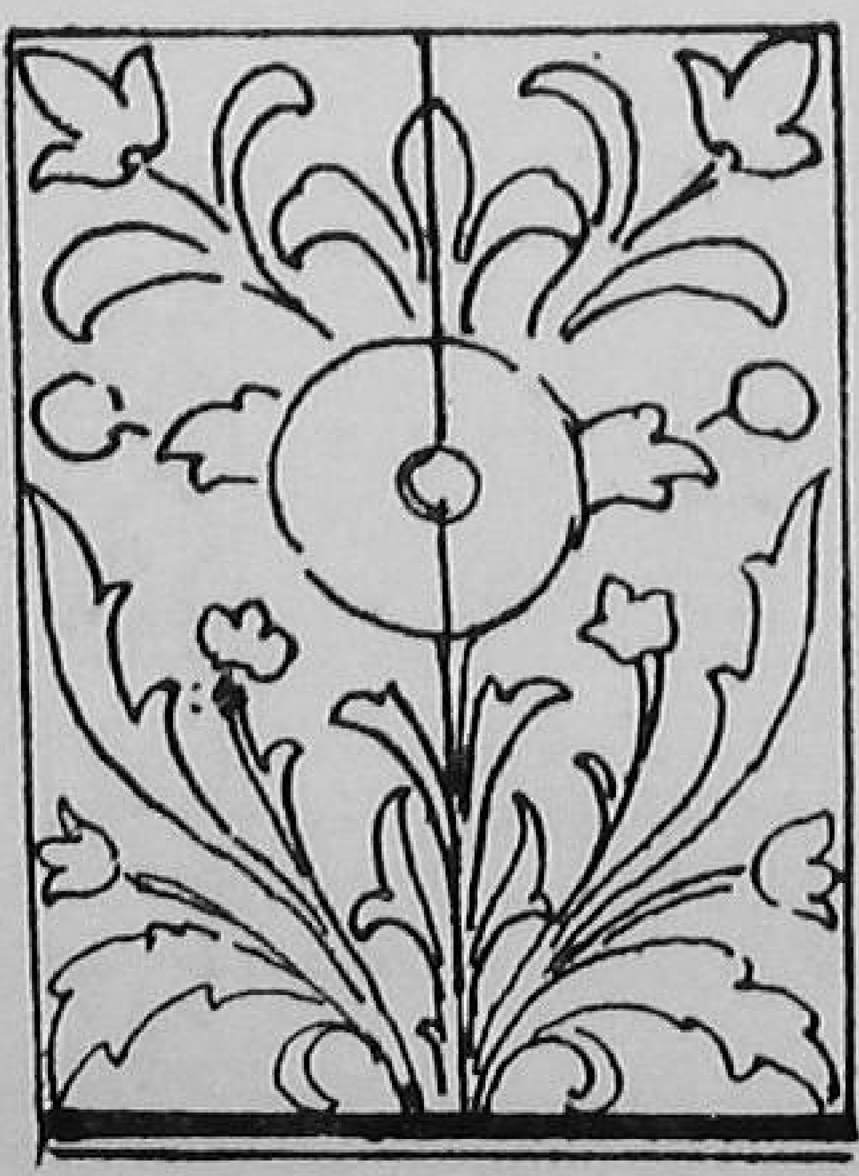


Fig. C

Exercise 4. BALANCE Symmetrical designs are more mechanical and one has to copy exactly the other side of the unit. The application of the principle of balance can dispense with copying in order to establish balance in the design; the weight of the design should be well distributed in respect of its lay-out of masses and groupings. Its opposite distributions of groupings must be almost matching and equivalent to one another, though the details or motifs are different. The symmetrical design (C) has been changed to illustrate the principle of balance as at Fig. (D).

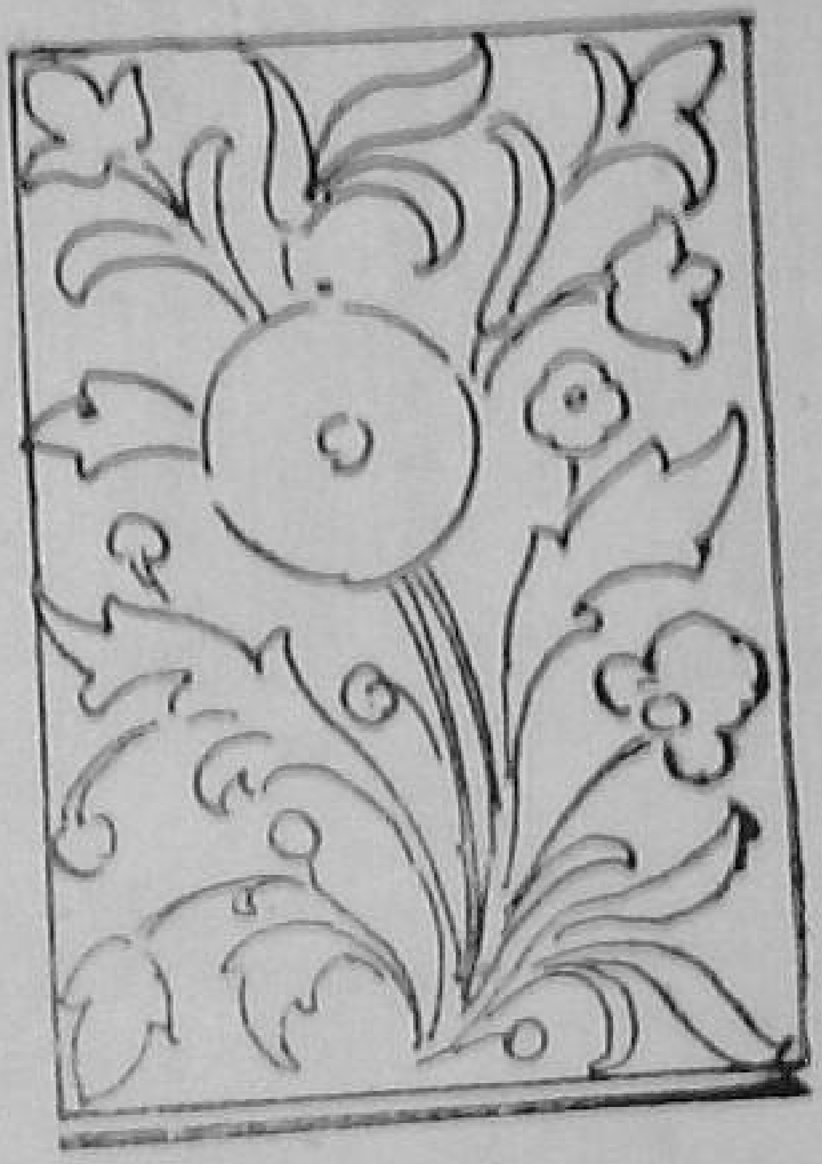


Fig. D

Selection of Motifs

Now something on the selection of motifs.

In the Basic school, the motifs in designing should be selected from simple geometrical and floral forms, leaving more complicated forms e.g. human, animal and organic.

Geometrical Patterns

Junior Basic children may be expected to produce better results in designing with geometrical motifs. They should use lines, curves and other simple geometrical forms in designing.

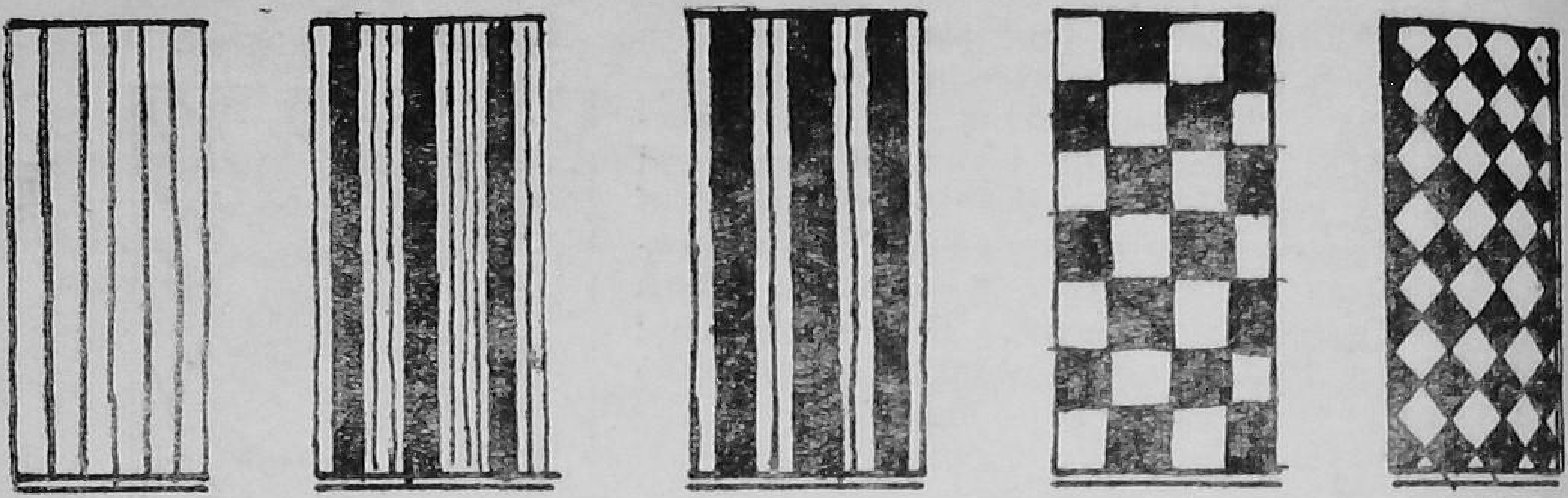
Designs based on lines and curves have great utility in our dress and hanging fabrics, etc., due to their simplicity and easy adaptability in mechanical processes. Children may be asked to observe the use of various forms of lines, coatings and other apparels of daily use.

Children should be given practice in drawing such patterns that will give them ample scope for exercises in line, colour and form. They should draw these patterns in free-hand in pencil, pastel or direct with colour and brush.

A few designs are given below :—

1. Straight lines at regular intervals.
2. A thick line with two thin lines on both sides, forming a unit and their repetition at regular intervals.
3. Thick stripes at regular intervals with a thin line in the middle as filling.

4, 5. Square, oblong, rectangle or any other geometrical patterns.



1 2 3 4 5

There is an unlimited number of geometrical patterns based on lines and curves. As patterns, these have the advantage of continuity to any length and breadth. A few graded exercises are illustrated below :—

For these a compass, ruler and set-square may be used.

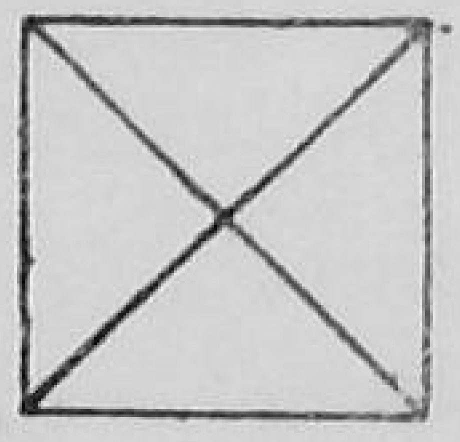


Fig. 1

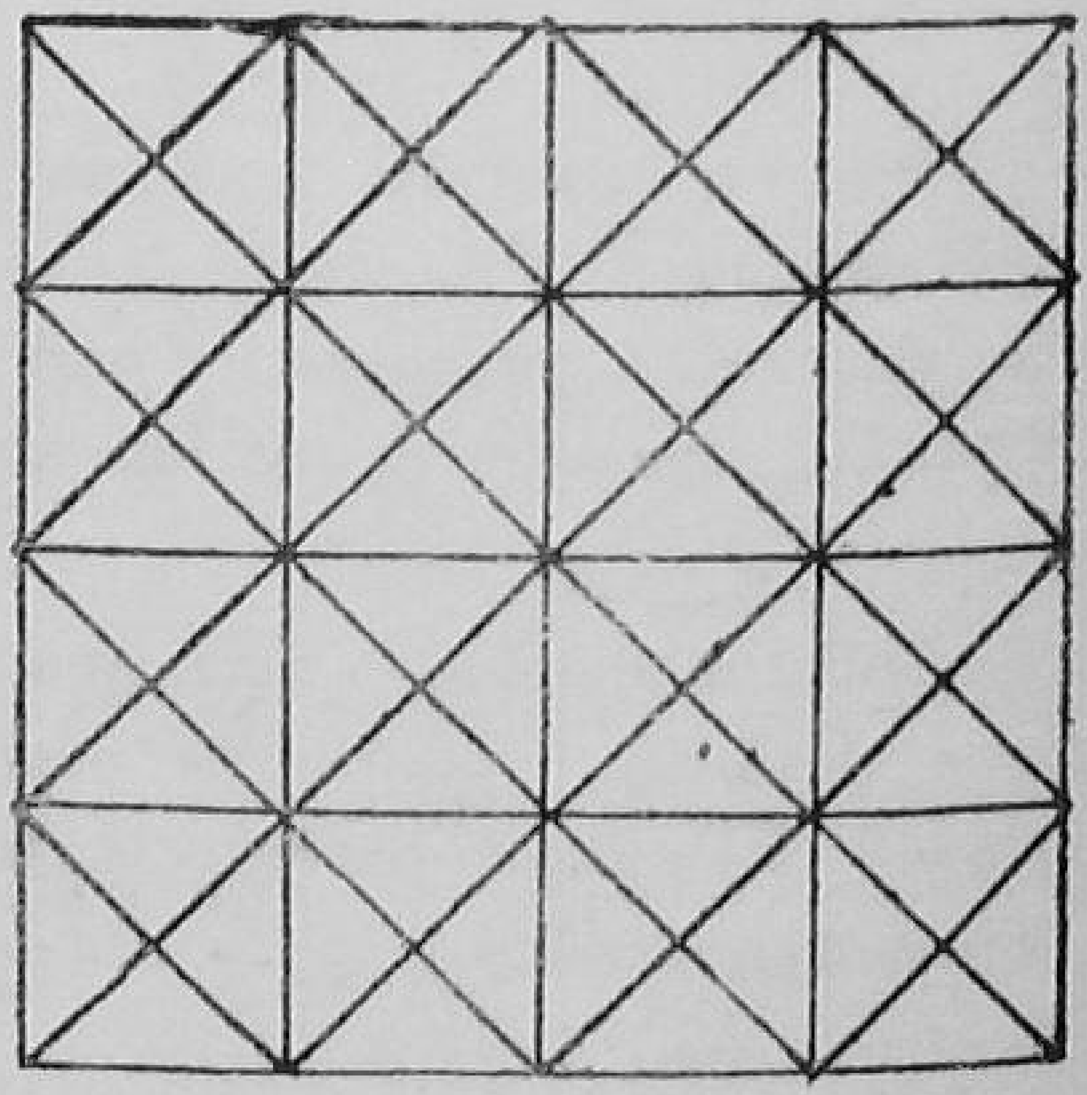
Exercise No. 1

Based on Straight Lines

Draw a square and join its diagonals. This forms a unit as at Fig. (1).

For an all-over pattern divide the paper into any number of equal squares, say 16. Fill each square with this unit and complete the design as shown at (A).

A



Exercise No. 2

More Elaborate

Based on oblique and straight lines.

Draw a square and join the diagonal 1,2 and divide it into three equal parts.

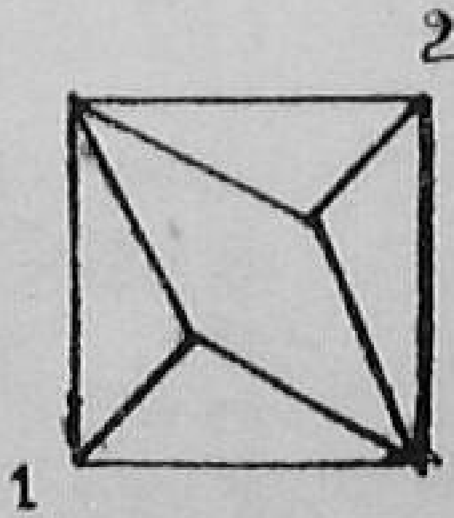
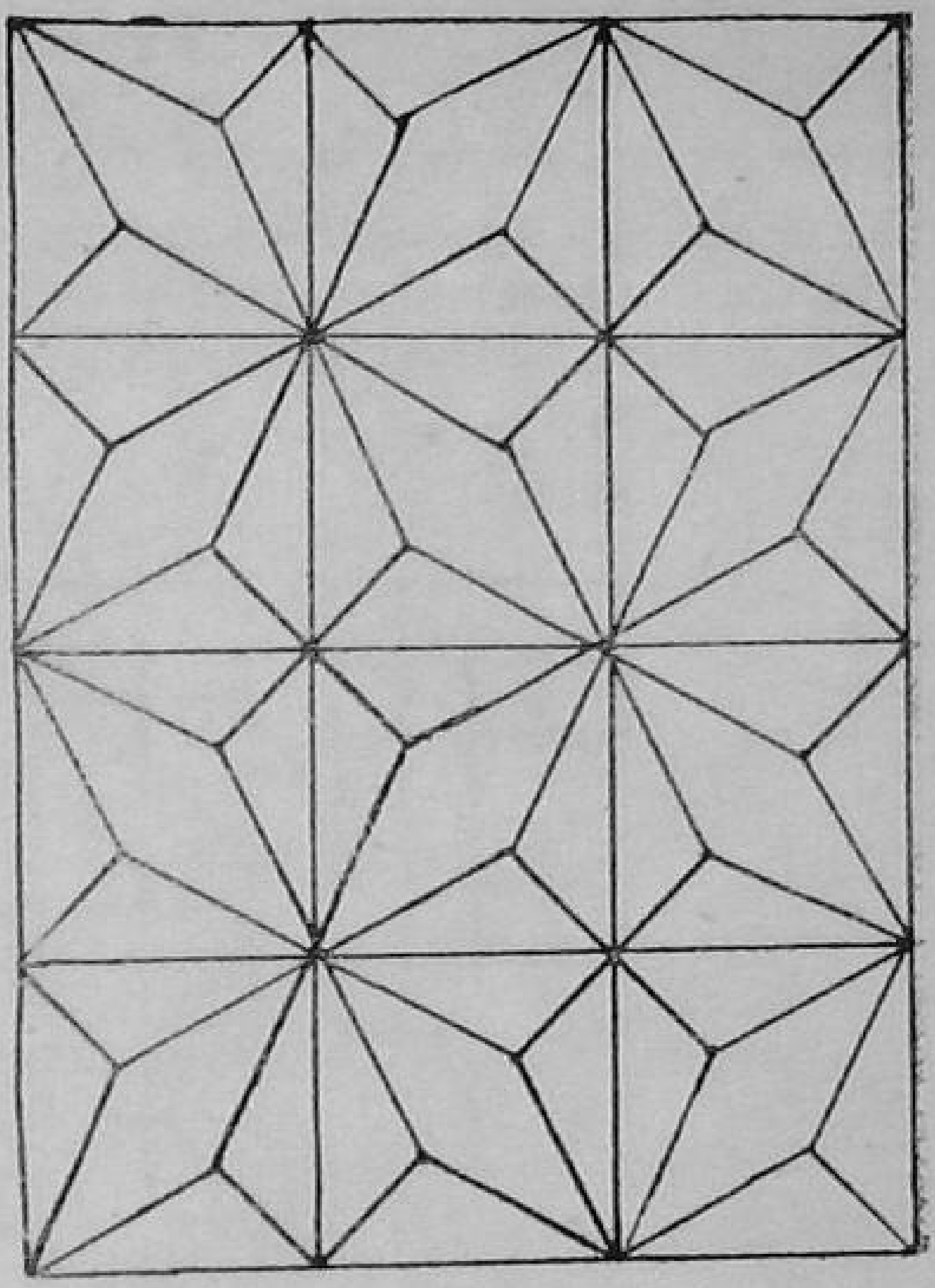


Fig.

Join the points of division with the opposite corners of the square. This will form $\frac{1}{4}$ unit as at Fig. (2) and by doubling it into the squares on the adjacent sides, it will form a complete unit. For an all-over pattern, draw a network of squares and fill in the design as at B.



B

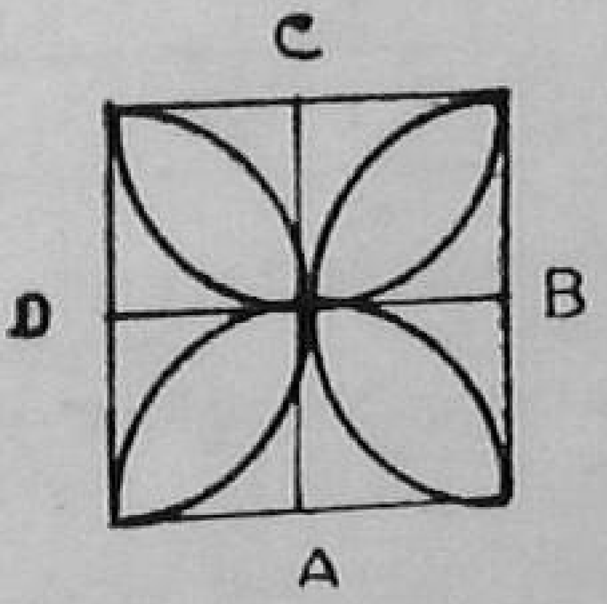
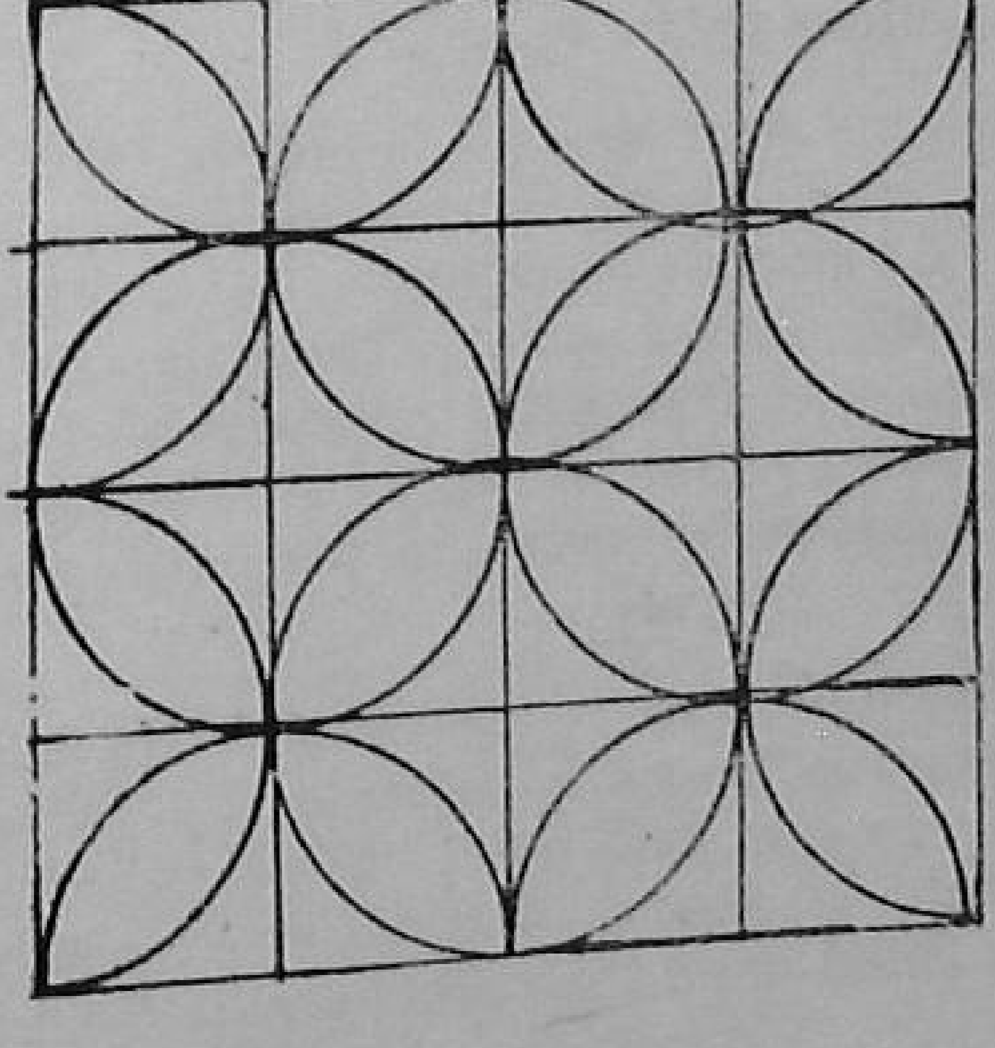


Fig. 3

Exercise No. 3

Based on Semi-circle

On a network of squares, suppose first four squares as one unit. With centres A. B.C. and D. inscribe semi-circles. This will give us a unit of four-petal form as at Fig. 3. For an all-over pattern repeat the process in other squares and complete the design as at C.



C

Exercise No. 4

Based on Straight and Curved Lines.

Generally all geometrical patterns are based on a network of squares. The construction and working of such patterns may be shown and explained to children on the blackboard.

D

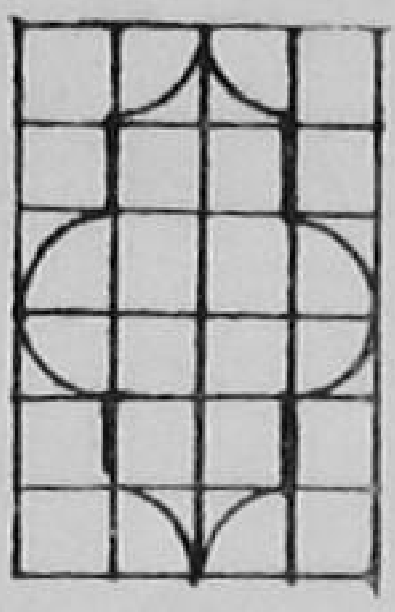
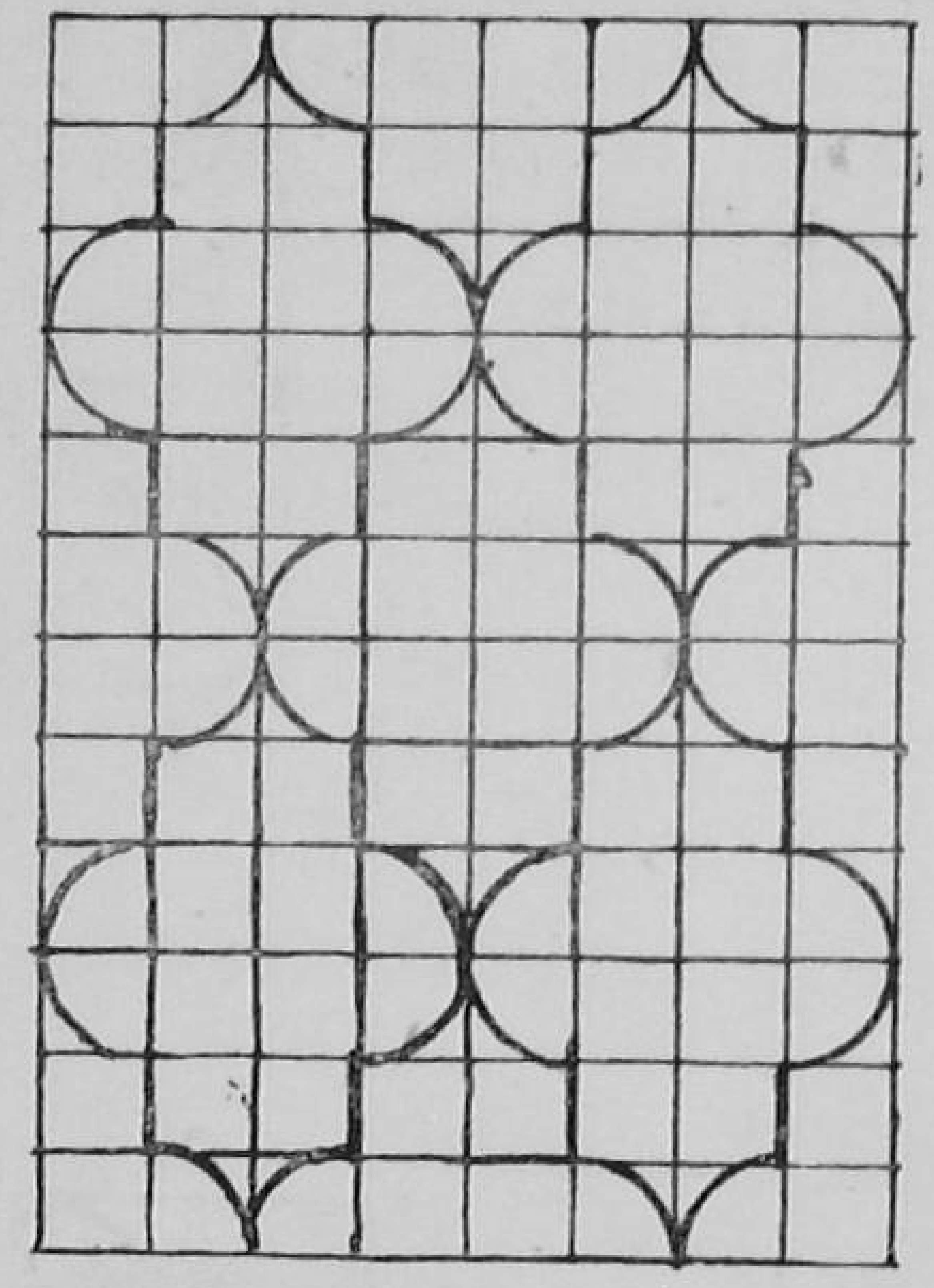


Fig. 4

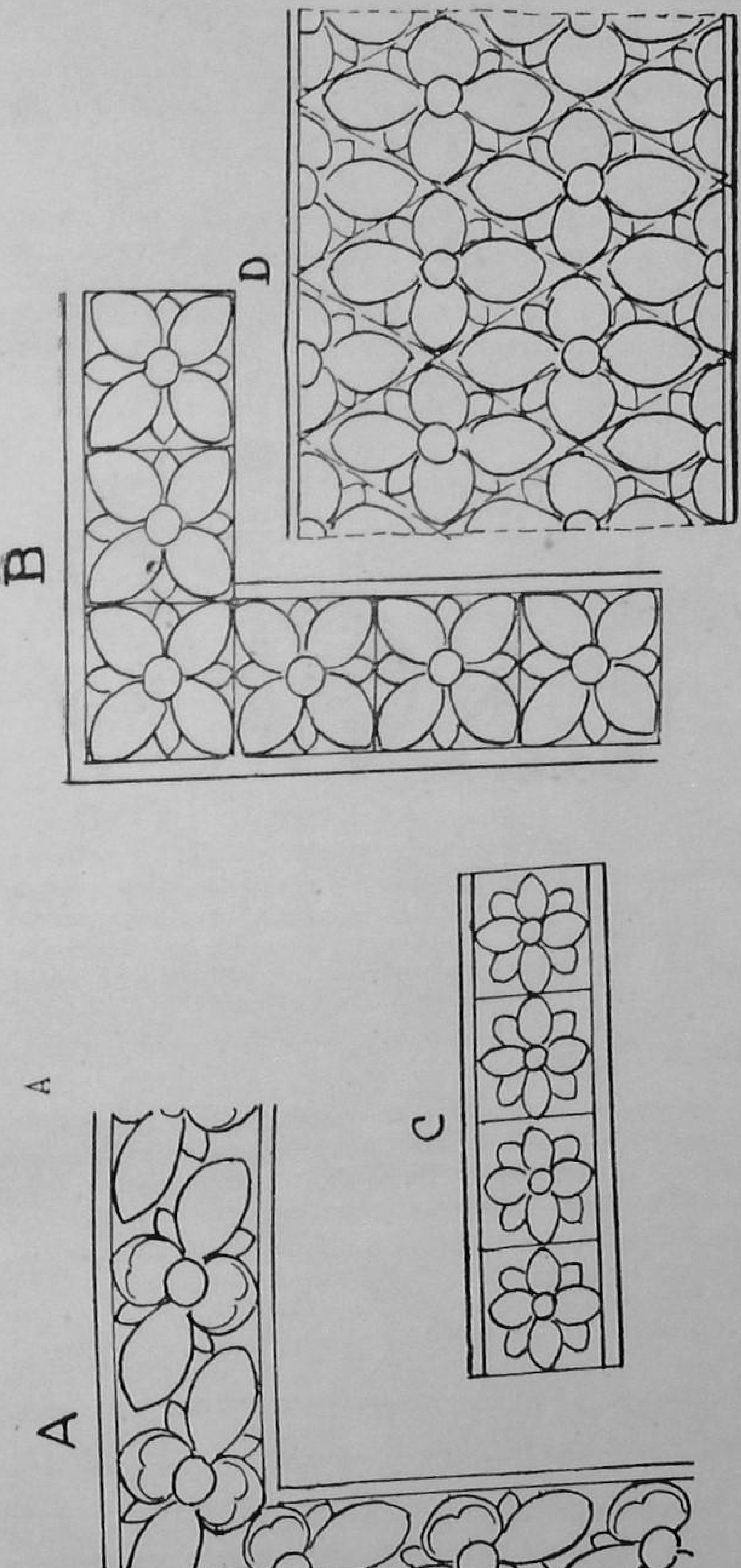


Follow the construction of the given unit in a rectangular space of six squares on one side and four on the other as at Fig (4). Repeat the process for all-over patterns throughout the squares and complete the design as at D.

Repetition of straight lines and curved forms and the harmonious divisions into spaces of geometrical figures e. g. squares, triangles, rhombuses and circles etc. will make suitable units for borders, frames and many other patterns.

Geometrical designs were brought to the highest perfection by the Arabs and Moors, where due to a religious dogma, representation of natural forms was forbidden. So all their ornamentation was based upon lines and curves only. Their murals and decoration of mosques and palaces with beautiful geometrical designs will always be remembered in the history of the world. Exquisite geometrical designs can also be seen in Mughal architecture, in the latticework of carved stones, inlay work and other details.

Kashmir, noted for artistic crafts, has an unique industry of ceiling designs and latticework, called locally "Khutambad". In this work only geometrical designs are used. Small wooden pieces are cut out in different geometrical shapes and adjusted according to a particular pattern and then fitted upon the ceiling and lattices.

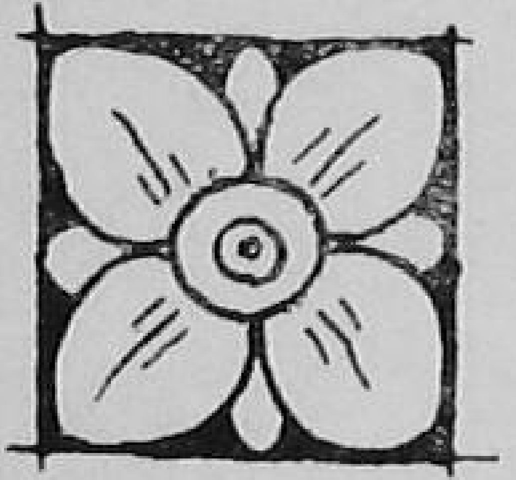

A
B
C
D

Nature converted into ornament to fit in with various geometrical shapes. Model Lesson No. 1.

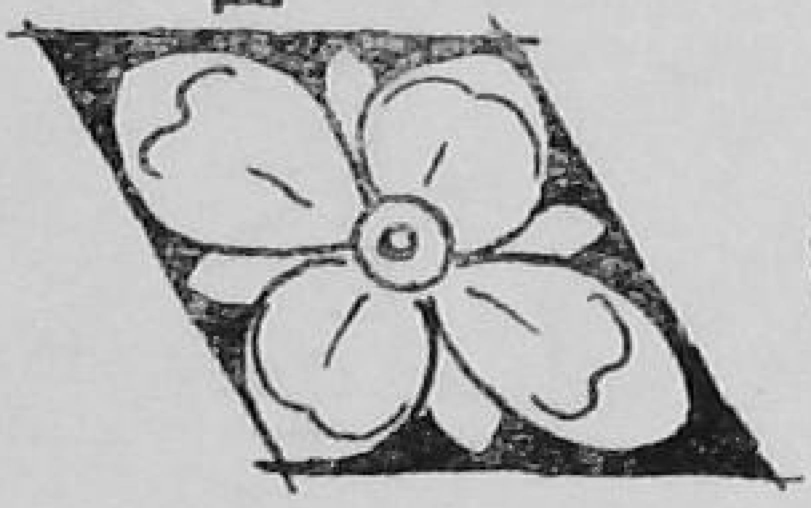
Children may be asked to prepare a design based on any flower, say a lotus, to fit in various geometrical shapes such as square, rhombus, circle and diamonds etc, as at the figures 1, 2, 3, and 4.

The construction of the lotus may be sketched from nature and drawn on the blackboard by the teacher in its front elevation, the circular form of a flower in full bloom. The shape of the petal and the general form may be specially pointed out and illustrated. Now the teacher may ask children to convert the natural form of the flower (lotus) into an ornamental design, and for this the petals may be made more regular in curve, equal in size so as to fit them into the required shapes as shown in the figures.

1

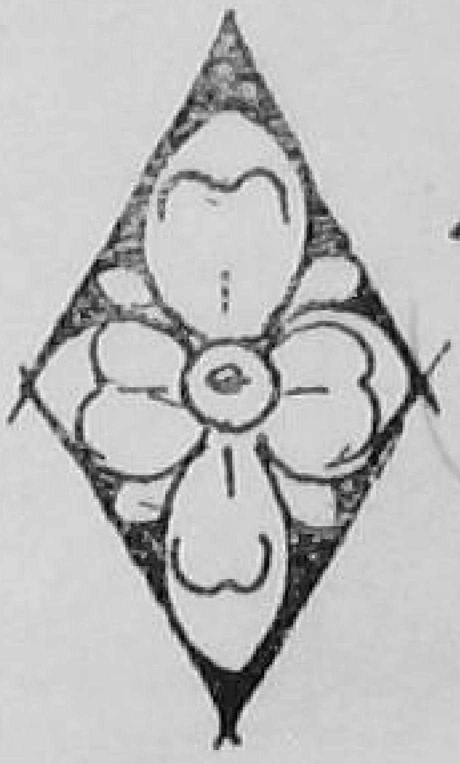


2



3

4



Such designs will be suitable for border frames and all-over patterns, etc. They can be constructed upon the network of various shapes drawn on paper and then filled in with unit in each space. For instance, the frame designs at A and B are fitted with Fig. (1) and (2) and the border design at C is fitted with Fig. 3 and an all-over pattern is fitted with Fig. 4.

Meanders for Border Designs

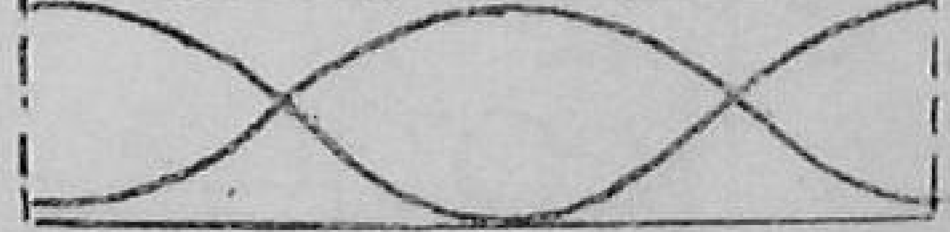
Keeping in view the standard of such small children designing in various shapes, other than borders, will be much more difficult ; border designs should be mainly practised. Therefore, for this purpose a few meanders have been illustrated. These are very important for constructing a border design and form a continuous stem from which leaves, flowers, fruits and buds etc, can be thrown off at intervals to form a design.

Meander as at Fig. A. This may be doubled, forming a loop as at B.

Curves taking various shapes may be thrown off at intervals from either of them as at C and D.

A

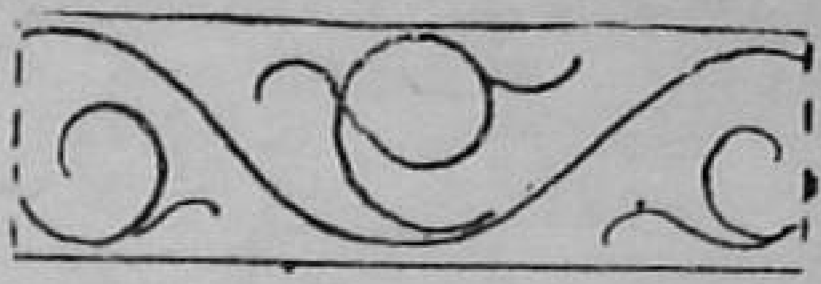
B



C

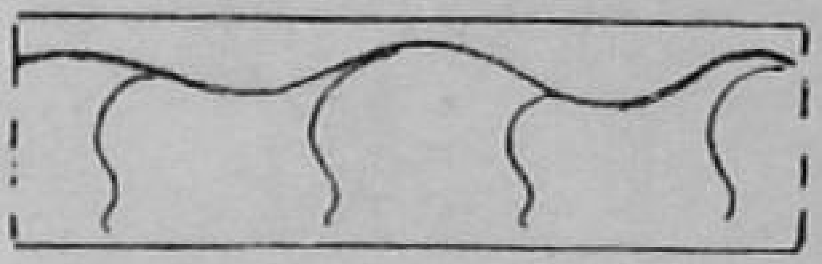
The main stem may be placed at the top or the bottom of the border, throwing off branches in various ways as at E and F.

D



Some border designs have already been illustrated elsewhere. The teacher may ask children to construct designs on these meanders to widen their knowledge in designing.

E



Further Exercises in Design.

F

For further studies in design, flower and leaf forms should be studied from Nature. And they may be simplified and are conventionalised as required. The selection of the flower and making the design from its form must be left to the child. The teacher's criticism of the design should serve to guide the child in a future choice of flower and design.

Design on Actual Specimens

In order to show a child the practical use of designs, actual specimens of designs should be shown him. For this purpose ornamental objects of metals, earthenware such as jugs, cups, flower vases etc; carved wooden panels, furniture articles, boxes etc; jewellery articles, printed and embroidered fabrics and such other articles may be made available. The teacher may explain and illustrate them by sketching upon the blackboard.

Children may also be asked to notice various kinds of ornaments in their homes and neighbourhood and to prepare new designs from their imagination.

At later stages, designs for special purposes e.g. printing, weaving, embroidery, greeting cards, book covers and flower vases etc. may be practised.

Forms of the Objects Derived from the Natural Forms.

In addition to their adaptation to surface decorations, natural forms have all along helped man in providing him with ideas for the construction of the different objects of daily use. For instance, the lotus form, a symbol of purity and prosperity, with its decorative qualities has been used for thousands of years by Egyptians, Assyrians, Greeks, Indians and Chinese in art and architecture. Columns with capitals, shafts and basements were formed of lotus shapes in stone and wood, and are still seen in old monuments as at Fig. (A).

Its growth, the beauty of its curves and elasticity of stalk, has enabled craftsmen to use the lotus form in trades such as metal, wood and stone etc. The Kashmiri carver and metal worker produce various such

patterns in the shape of table lamp stands and many other articles as at Fig. (B), (1) and (2)

Fig. A

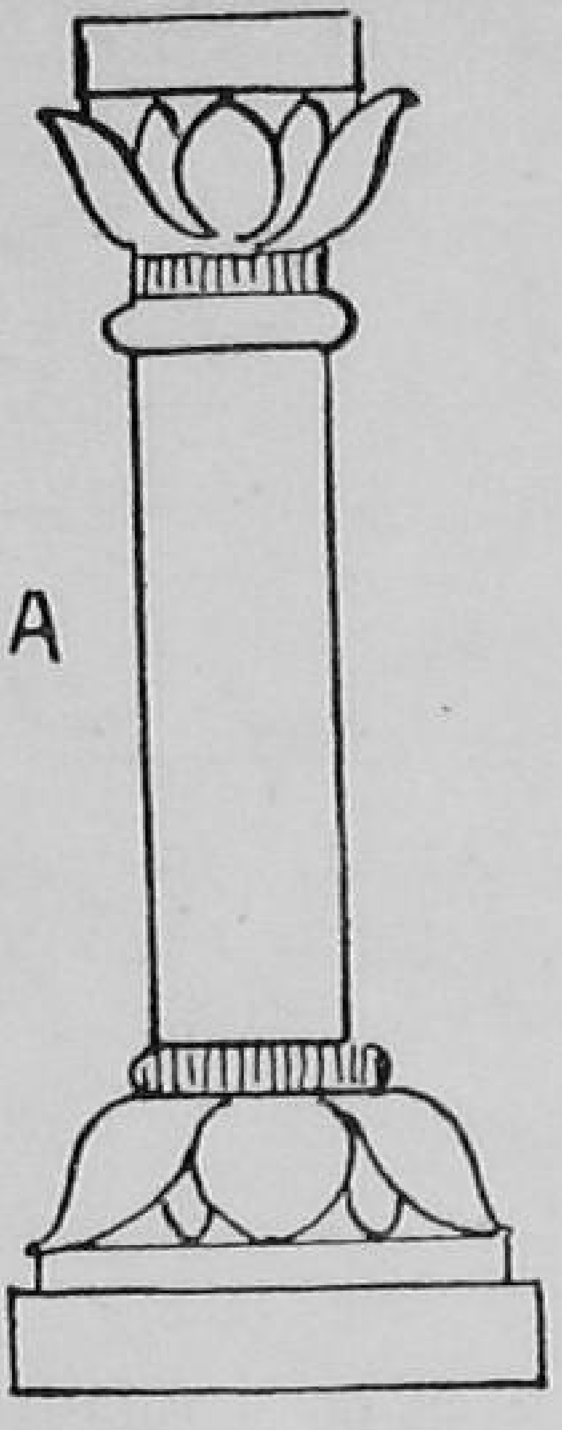
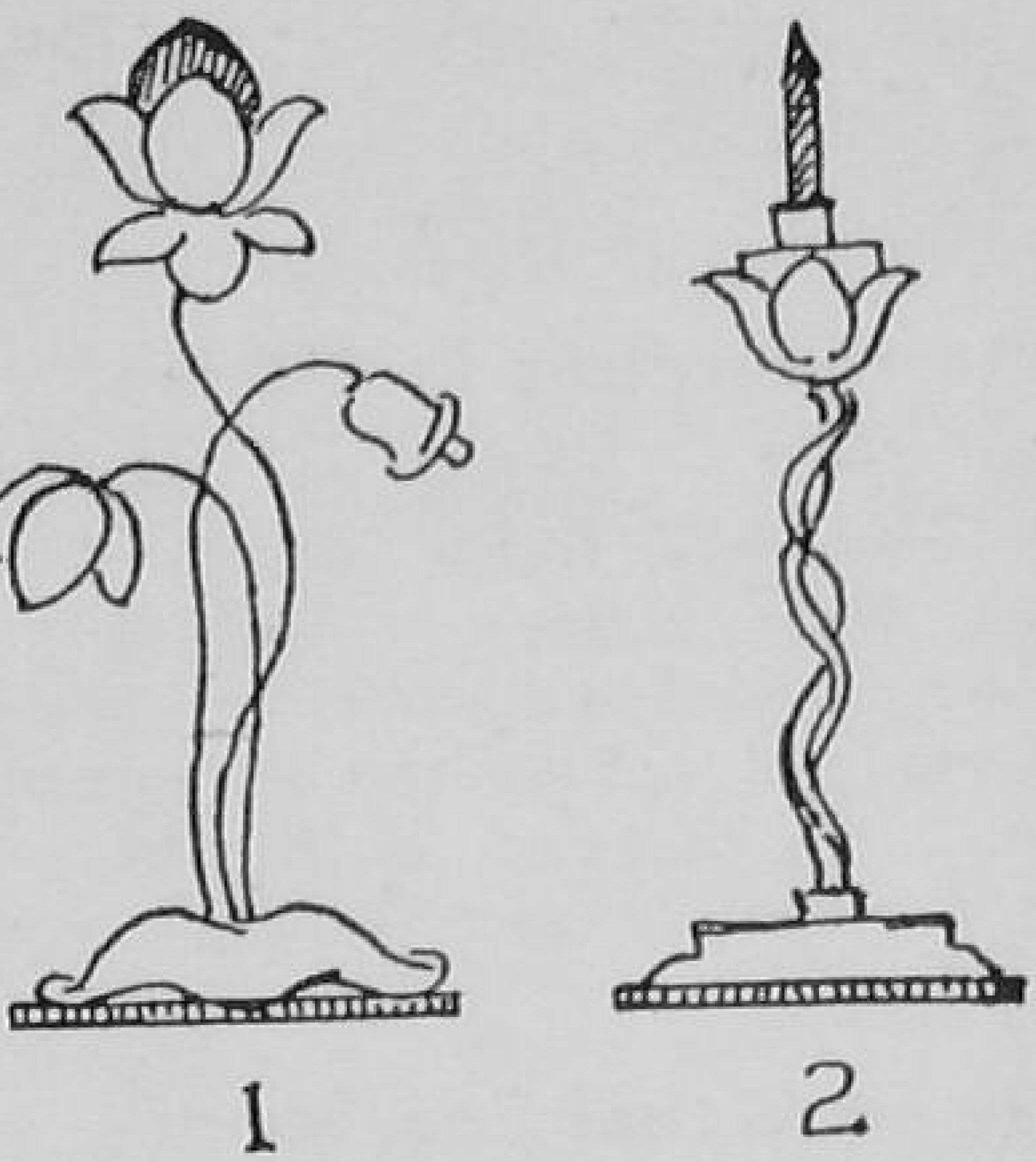
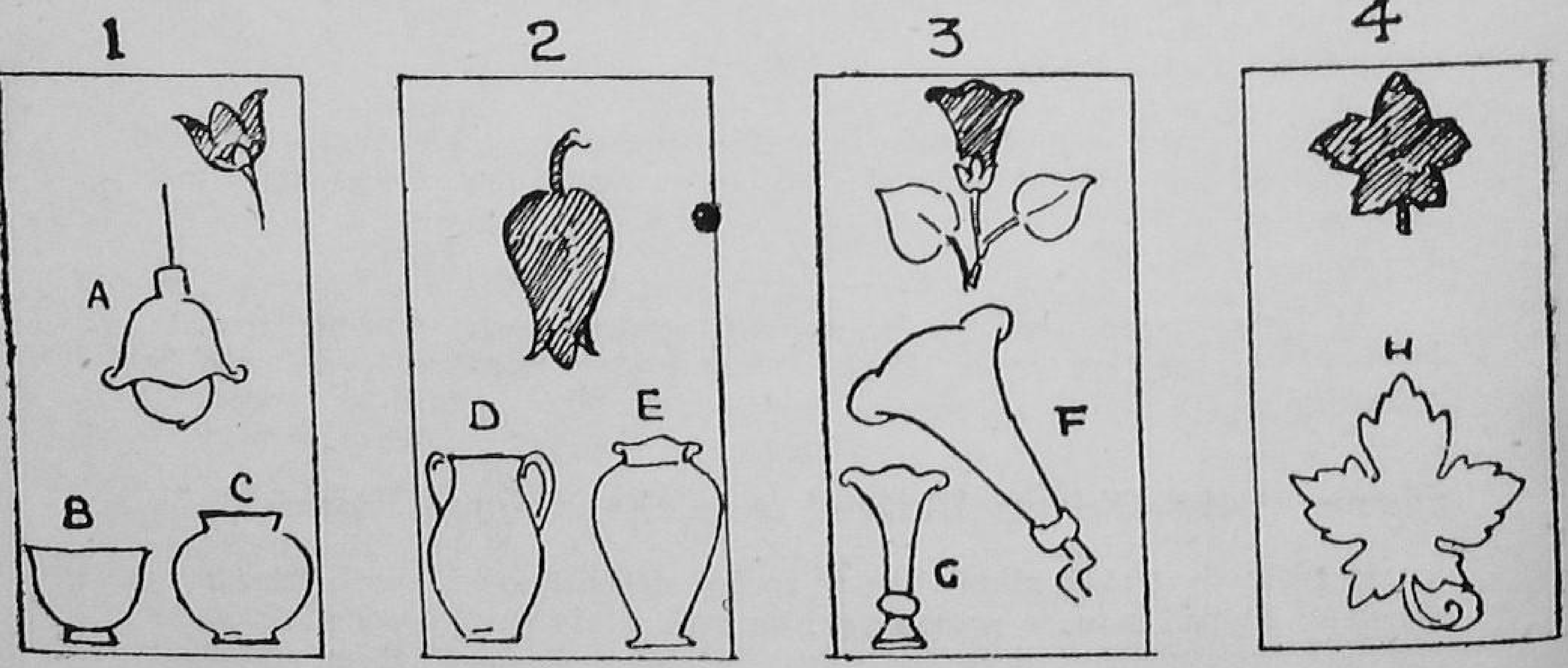


Fig. B.



Although such designing is beyond the scope of young children, yet to make them appreciate the relation between art and Nature, some more illustrations are given below :—



No: 1. Harebell; shapes derived: lamp shades, cups and bowls as at A, B, and C respectively.

No: 2. Bluebell shapes derived:—jug, flower-vase as at D and E.

No: 3, Convolulous shapes derived: horn shape and flower vase as at F and G.

No. 4. Vine leaf ; shapes derived :—ornamental trays of metal and wood as at H.

Conventionality of Natural Forms

The study of Nature is not enough. The artist of originality sees Art and Nature in his own way and with his knowledge and experience works out a convention of his own.

In the following illustrations, an attempt has been made to show how a form (rose flower) can be conventionalised for practical application in designing.

Figure at A is a garden rose drawn from Nature.

Figure at B, this has been represented in three-fourths view with symmetrically arranged petals.

Figure C is the same representation as at (B) with a more geometrical arrangement.

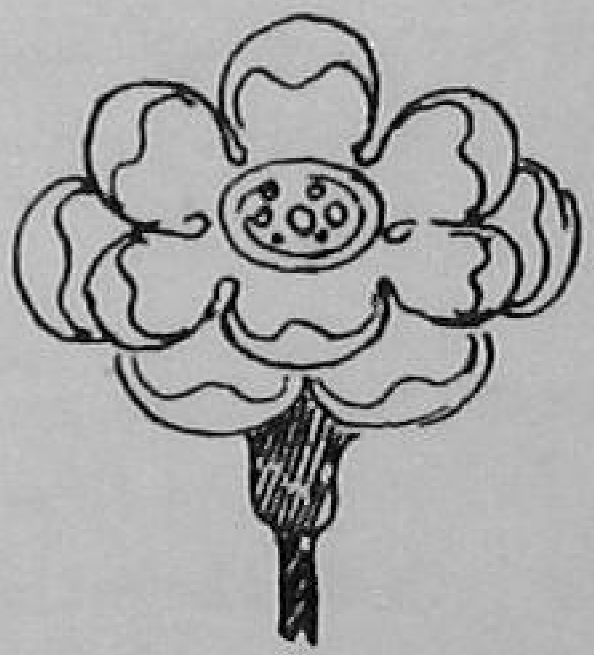
A rose form with it's overlapping petals and a band of small circles at the centre to represent seed-vessels as at D.

At figure E again the same treatment with a slight difference in the central arrangement. The circular shape has been converted into the square form by placing four half-leaves at the corners.

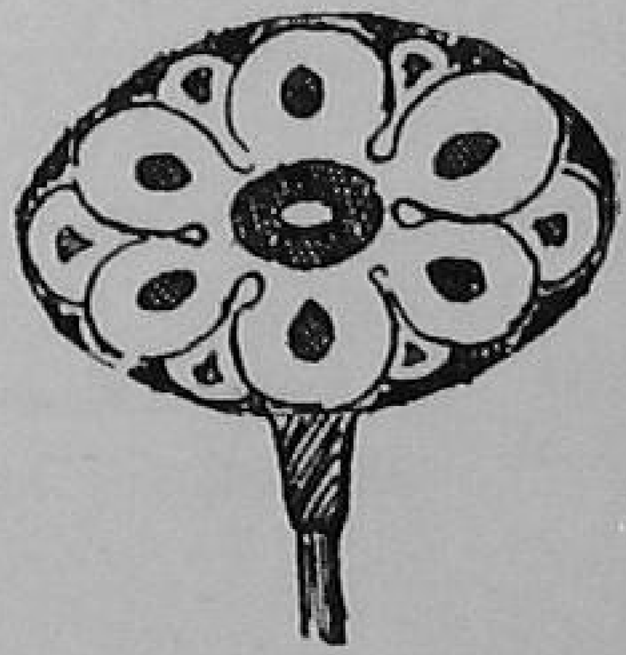
It may also be noted that such conventionalised forms being bolder, clearer and simpler can be adapted to various surfaces of different materials, such as wood, fabric, metal and so on.

The designer should constantly bear in mind, that his designs are meant to make things look more beautiful. Simpler designs should generally be preferred to complicated ones. Over-burdening a design with floral and other motifs, over reaches itself and defeats the very purpose it has to serve, namely enhancing the beauty of the object.

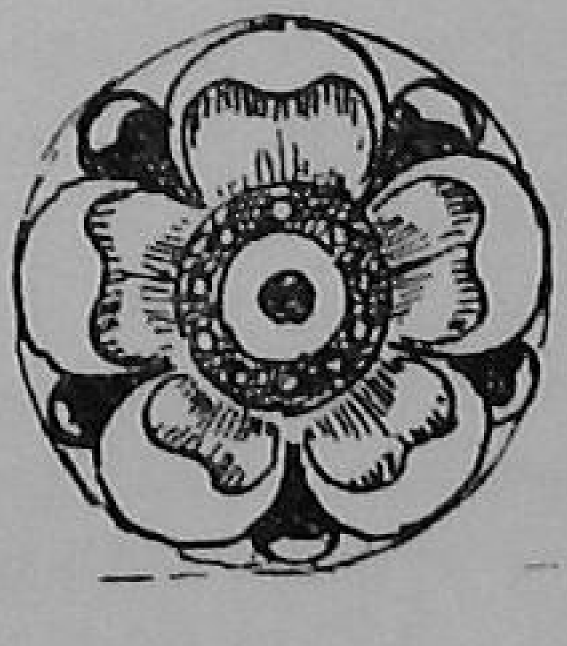
A



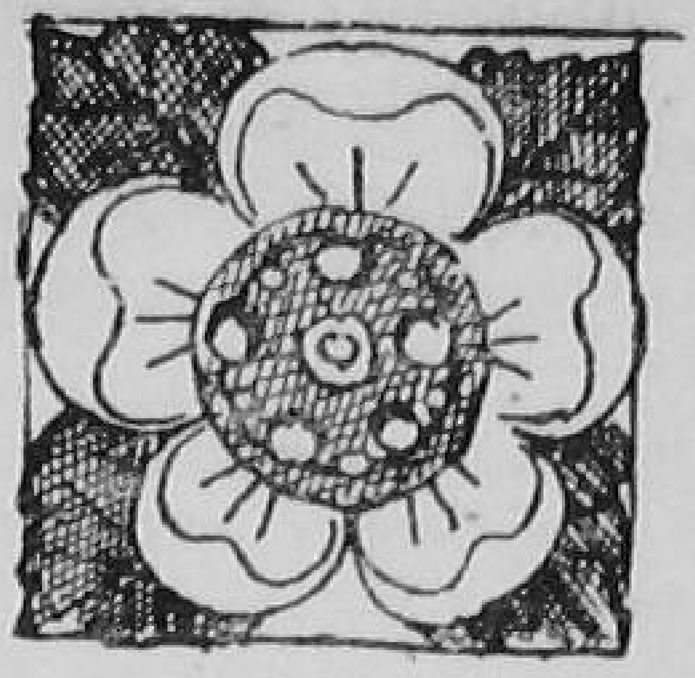
B



C.



D



E

In conclusion, it may be said that our aim is not to make the child a professional artist but to promote the development in him of good taste so that a suitable background for appreciation of art is created in his mind, his aesthetic sense is sharpened and developed, and he delights to draw in line and colour. If such a training is given to our children, they can help to remove what is ugly and shabby and retain and improve what is beautiful in our social life.

Block and Stencil Printing

Printing

Children are so prone to printing patterns that they use coins, stamps or such other articles whose surfaces have been incised, carved or embossed in high or low relief for doing so. They rub these articles with ink or colour and dab them over on their clothes, books, walls, and even upon their bodies.

We could easily have some simple wooden blocks in our school to give children an idea of how to produce a pattern on any surface. But the process is both mechanical and monotonous. It is mechanical, for it is a matter of merely stamping the block on a surface to produce its impression and there is nothing intellectual about it. It is monotonous because of the limited number of such blocks that one may have. It is impracticable to have a large number of such blocks so as to cater for the varied tastes of children. This is a great impediment. This impediment can, however, be removed. We have another method that can be substituted for block printing. We call it stencilling.

Value of Stencilling

Stencil means a thin plate with a pattern cut through it. When it is laid flat on a surface and brushed over with a colour, the surface below is marked by the pattern on it.

A stencil plate when prepared by a child himself according to his own selected pattern will be a source of joy and pride to have. He will go about displaying its prints to his parents, friends and others.

Method of Preparing the Stencil Plate

A pattern may be drawn on a good quality of cartridge or brown paper which may be cut by a pen knife or a specially made stencil knife. For cutting the pattern, place the paper upon which the drawing has been made, flat on a glass plate or a glass pane to produce clear-cut lines. If cut upon a wooden board or any other surface, the cut lines would not come out sharp and clear and the surface will also be damaged.

Exercise I. Suppose a child wants to make a stencil plate of an apple.

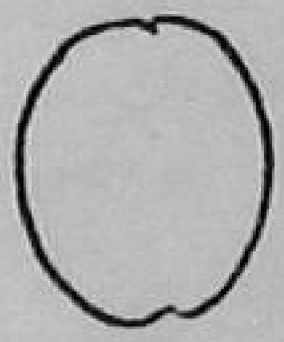


Fig: A

Let him draw the apple on a sheet of paper as in Fig. (A), and cut the Pattern by running the knife over the drawing as in Fig (B). The plate is now ready for use. If the same pattern is to be cut with its stem, as in Fig. (C), a difficulty arises. The place at (1), where the lower part of the apple and its stem meet, will weaken the plate, if the whole of the pattern is taken out and will not, therefore, stand the process of dabbing. The plate will tear away.

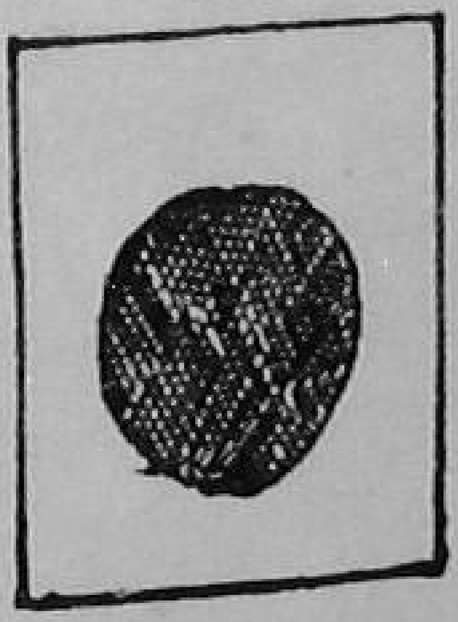


Fig. B

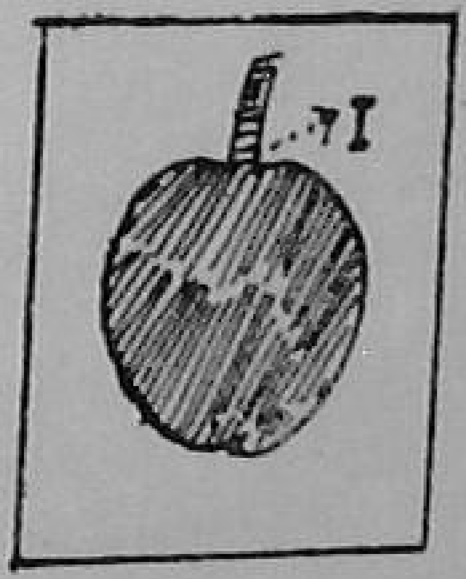


Fig. C

This difficulty can be tided over by leaving some blank space (a gap) between the stem and the apple as in (Fig. (D) at (2). This leaving of space is called a stencil tie. It helps in strengthening the plate and also binds differen tparts of the figure together to make it one whole.

Fig. D

In preparing stencil plates, such ties are of paramount importance and without sufficient knowledge of the adaptation of such ties, stencilling is impracticable.

Exercise II. To illustrate further the necessity of ties in a stencil plate one more exercise is given. Suppose a stencil plate of a letter 'O' 1" high is to be prepared as at Fig. [E]. If the space between the two circles [thickness of the letter] is cut away by a knife as in Fig [F], their inner surface at [X] will automatically be torn away along with it. The letter "O" will not look like "O" but like a simple circle as in Fig. [G]. Thus the stencilling of the letter "0" becomes impracticable.

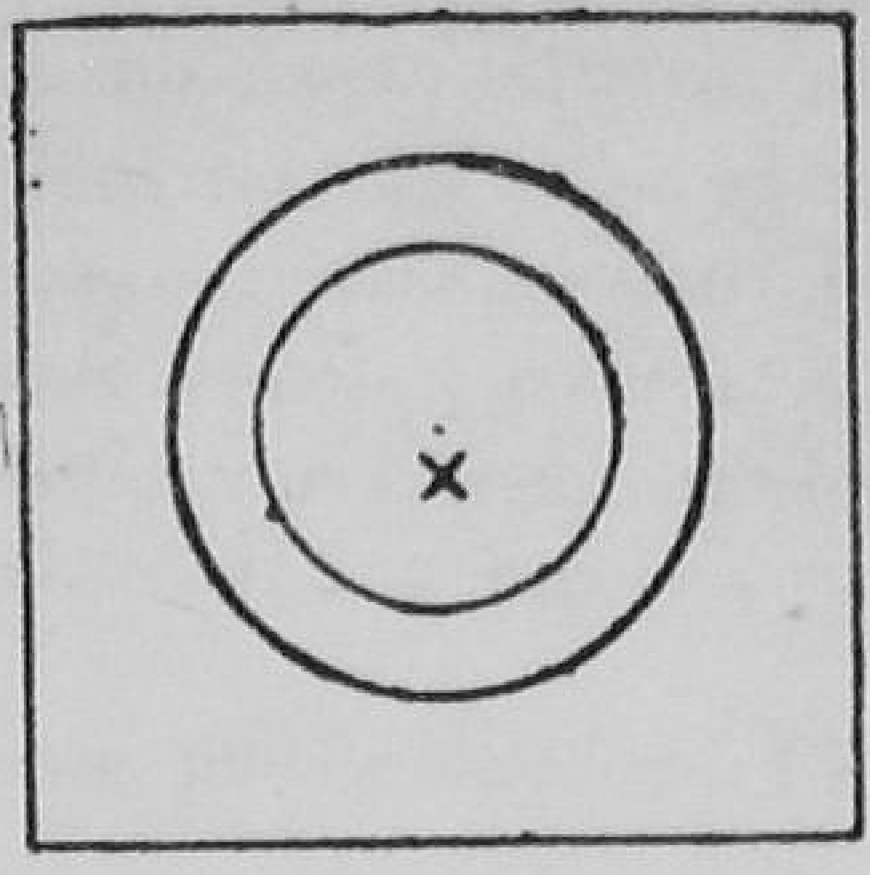


Fig. E

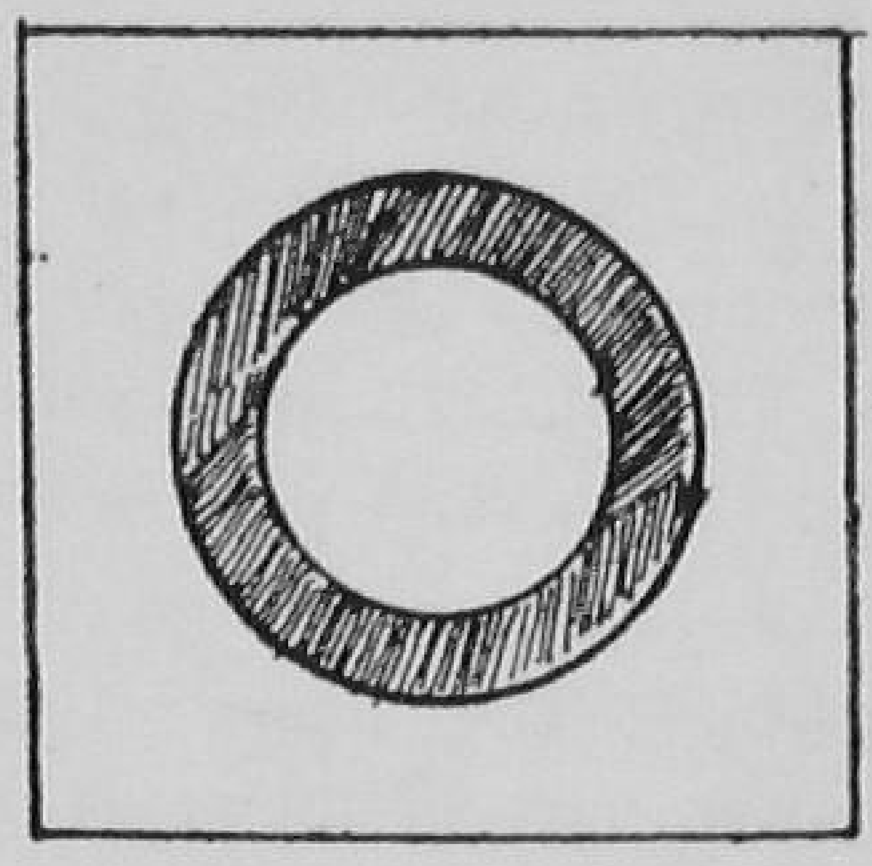


Fig. F

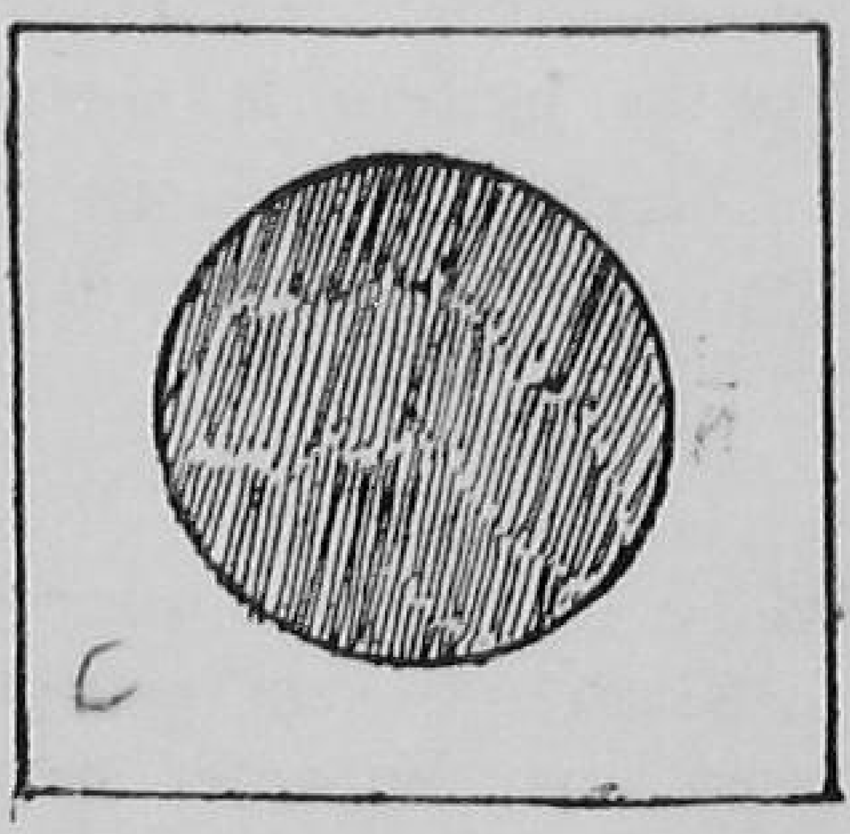


Fig. G

To overcome this difficulty, ties are ready for service, if we only know how to make use of them.

To produce the letter "O" correctly we will place ties at suitable places as in Fig. [H] at 1, 2, 3 and 4 that will bind the outer circle to the inner one and both to rest of the paper that lies as background to the letter "O". These ties

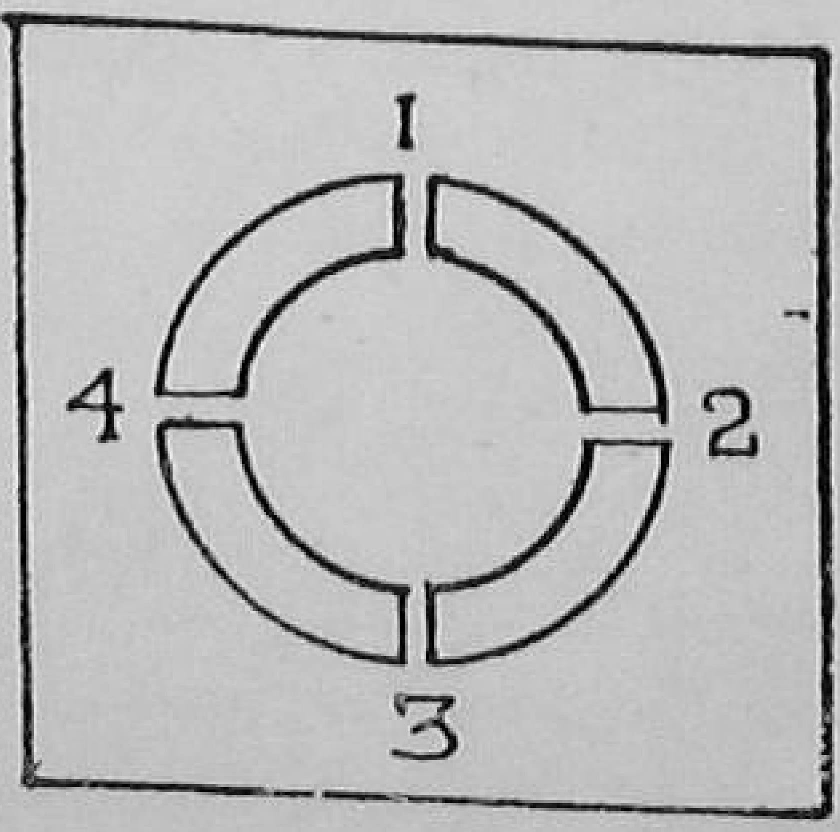


Fig. H

will also form a connecting link for the two circles. When the letter "O" is out in this way, the stencil plate is ready for use as is shown in Fig. [I].

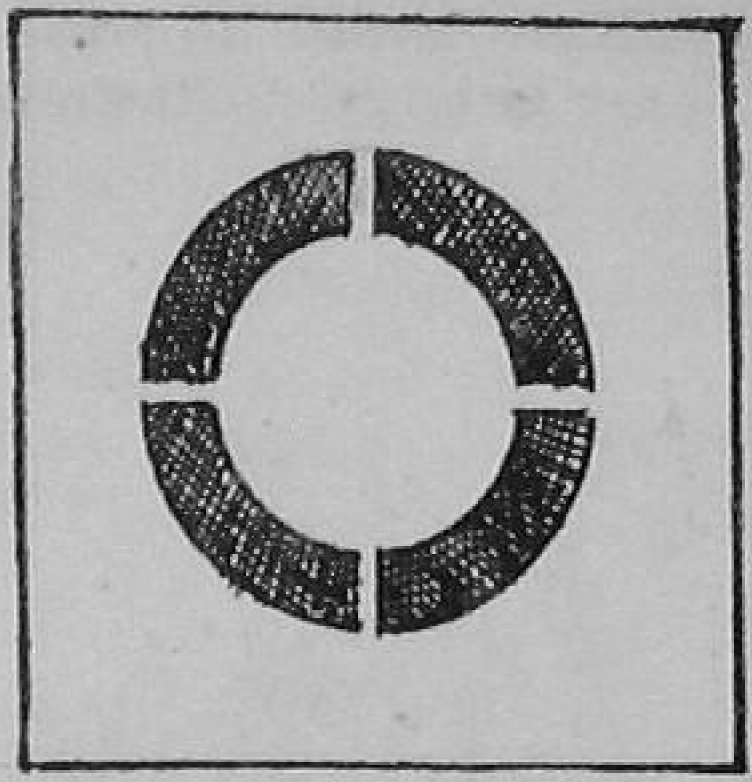


Fig. I

The same system of ties applies to all patterns, geometrical, floral or or any other form.

It may also be borne in mind that for producing multi-coloured patterns a separate plate for each colour is prepared.

Process of Stencilling

Now it is necessary to explain the process of dabbing. Place the stencil plate over the surface that is to be stencilled. Hold the brush in the right hand and place the left hand flat over the plate to keep it pressed over the surface. While dabbing, the particular portion of the plate should be kept tight with the help of the thumb and first finger so that the colour may not run beneath the edges of the plate and spoil the surface below. If possible, the plate should be fixed with drawing pins to the surface to be stencilled.

When dabbing, the brush should be held upright, between the last three fingers and the thumb, keeping the first finger at the top of the handle as shown at Fig. (B).

The required amount of colour should be placed on a wooden or glass plate. The brush should be dipped into it and it should be kept in view that only a reasonable amount of colour is on its tip to avoid overflow of the colour. Go on dabbing the colour till the pattern is filled and completed.

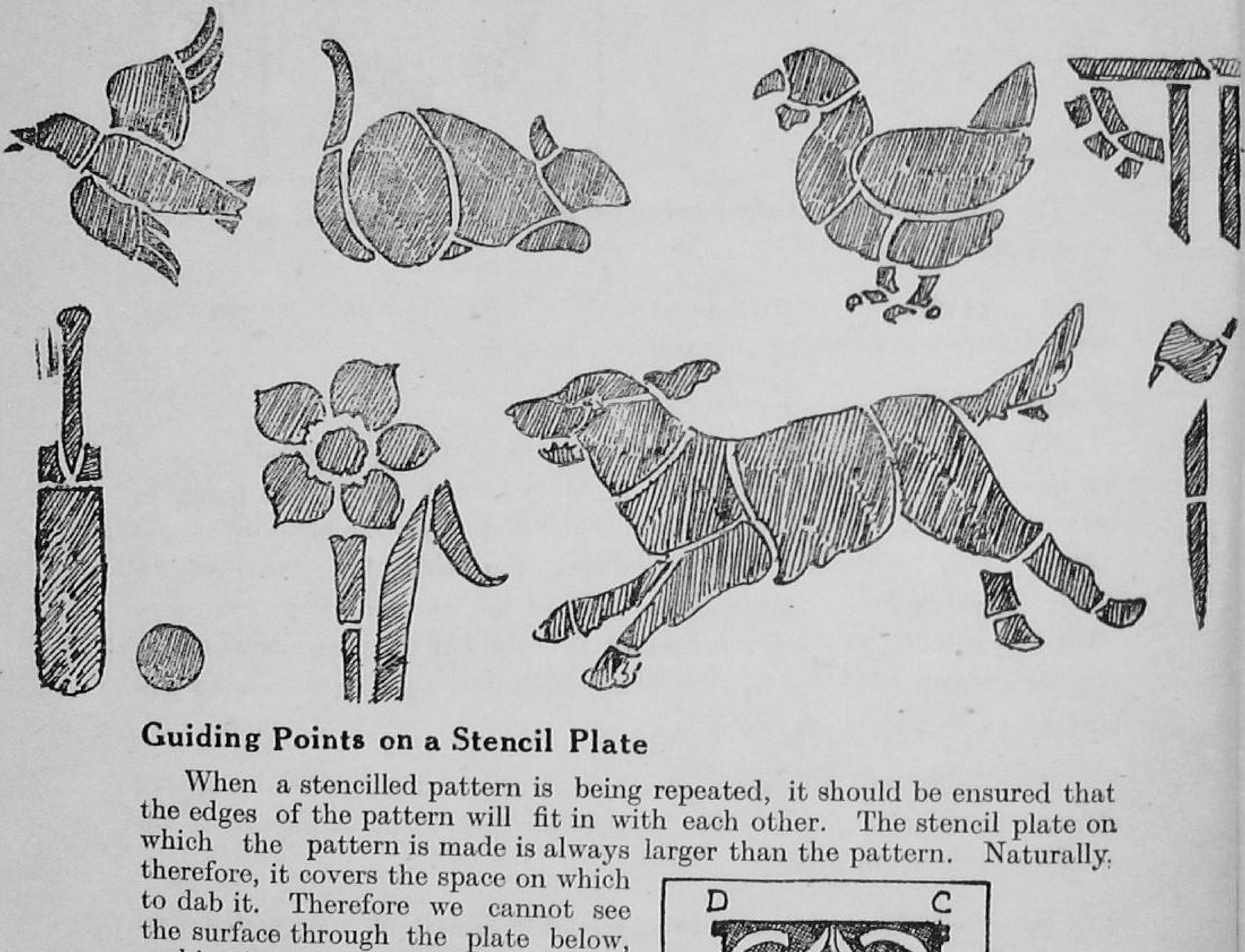
Some Simple Exercises

At the beginning, easier exercises should be tried, till the child is able to understand its technique and process. Gradually the exercises may be made harder. Birds, animals, sport articles, leaf and floral forms, letters and so on in simple and profile positions may be practised.

It should be remembered that the art and beauty of the stencilled figure depends upon ties which should be placed harmoniously in relation to the structural and anatomical aspects of the figures. Therefore, great

care and skill are needed to produce good results. The following stencils at Fig. (J) are given as an illustration of the point.

Fig. J



Guiding Points on a Stencil Plate

When a stencilled pattern is being repeated, it should be ensured that the edges of the pattern will fit in with each other. The stencil plate on which the pattern is made is always larger than the pattern. Naturally, therefore, it covers the space on which to dab it. Therefore we cannot see the surface through the plate below, making it impracticable to repeat the process of dabbing systematically at regular intervals. To avoid this, there must be some guiding points on the plate.

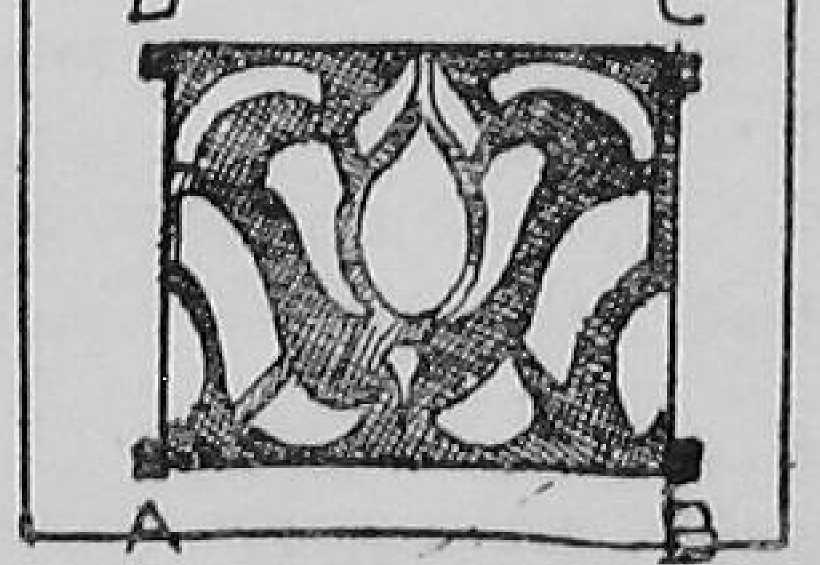


Fig. L

Suppose the given Fig. (L) is a stencil plate and the pattern in it is required to be printed upon the given figure (M). Now for marking the guiding points, enclose the given pattern at the Fig. (L) by straight lines, forming a border A, B, C, D. Cut small holes at these corners A,B,C and D. These will be the guiding points.

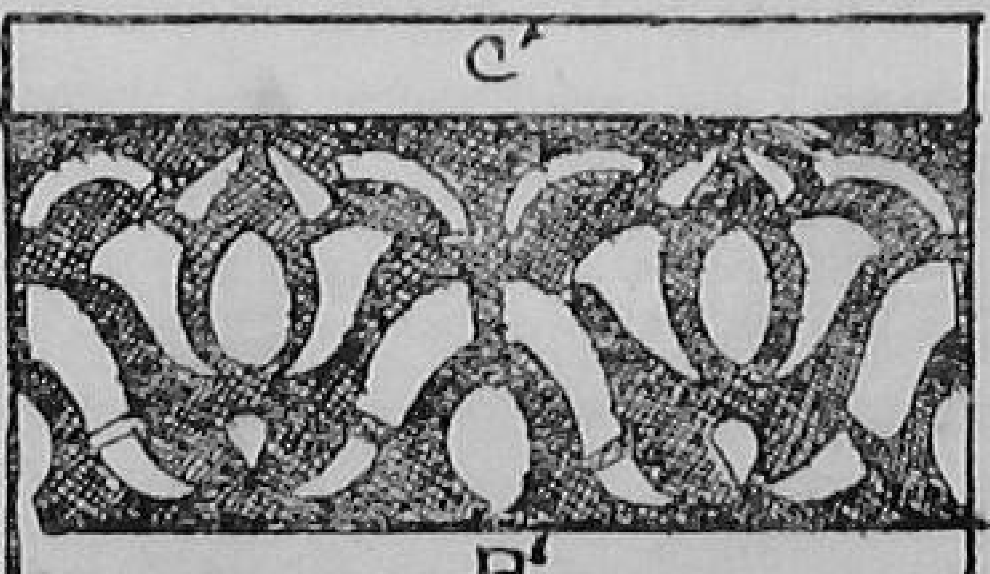


Fig. M

For printing it upon the Fig. (M), draw a base line of the required border as the line in

Fig. (L) over Fig. (M). Place the stencil plate Fig (L) over Fig. (M) and see the base line (L) through the guiding points (A) and (B). Adjust the plate well and dab the colour to complete the unit.

If the design (Unit) is to be continued, extend the base line (L) and repeat the process after carefully adjusting the guiding points (A) and (D) through their holes to B and C, at Fig. (M). Dab the colour. In the same way it can be extended to any length.

Material

The knife for such work is available in the market and is known as a stencil knife. It is suitable for this purpose. Its blade resembles a common Indian nail-cutter fitted into a wooden handle as shown in the Fig. (J), (A). It can easily be replaced by a pen-knife.

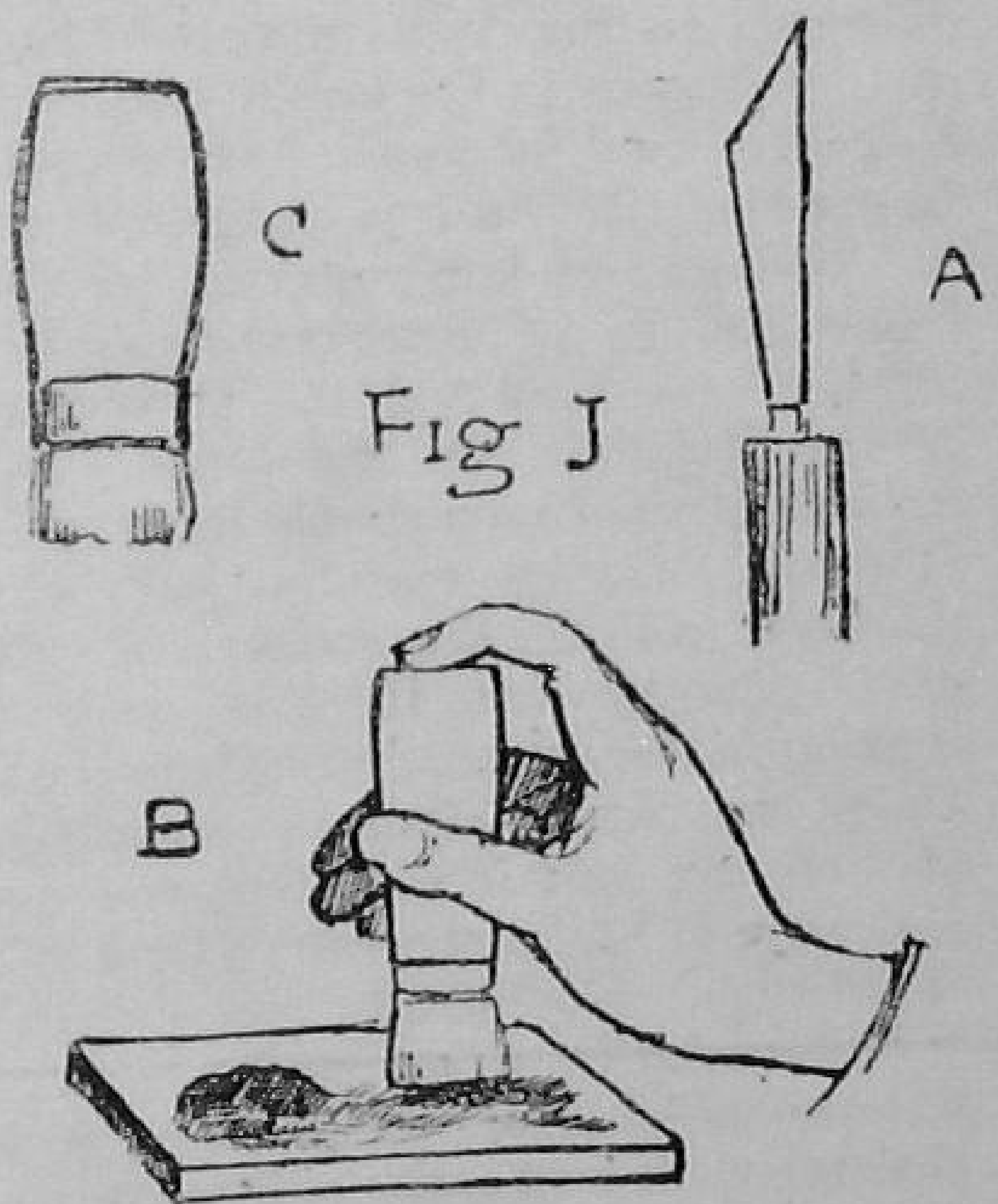


Fig J

Brush for stencilling as at (C) is quite different from all other painting brushes. It has a cylindrical shape with a round bunch of stiff hairs, fixed into a wooden handle. Its total length is about 4 to 5 inches. The hairs at the end are square (flat) and the diameter is about the same as that of its handle. For children's use a small piece of sponge may be substituted.

The colours to be used for such work should be distemper colours, mixed with glue or gum water for binding purposes and prepared to a thick cream-like consistency.

When a stencil plate is to be used for a few prints, ordinary cartridge paper or brown paper will serve the purpose, otherwise a specially made paper should be used.

Metal plates are used when a stencil is required to be used again and again.

If a stencil plate is required for future use, great care is to be taken to preserve it. It should then be placed quite flat between two thick pieces of cardboard.

As has been said earlier the colours used for this work should be distemper and the medium is, therefore, water that spoils the plate. If a coat of varnish is applied over the plate, its life is prolonged.

Chapter VII

THE NATIONAL LANGUAGE

The Problem

The question that confronts us at the threshold of our inquiry is: What precisely is meant by *Hindi as the National Language* ? We know of course that Hindi is one of the modern Indian languages, and a very important one. But the qualifying phrase attached to it places it on a different footing from the other languages and signifies that its jurisdiction extends to the whole country as distinct from any other Indian language that is confined to a particular region or part of the country. In our Constitution it is recognised as the official language of the country ....the common language that has to be used in the administration of the Union and in the inter-communication between the Central Government on the one hand and the Governments of the various constituent states of the Republic, on the other. It is necessary, therefore, that all the citizens of the Union should have at least a working knowledge of Hindi. It should form an essential part of their general education, thus giving them access to the life, society and culture of the people of a very large part of the country where Hindi is used. Moreover, it should be the means of creating better understanding between the heterogeneous people of the Indian Union inhabiting separate well-defined regions and differing from one another not only in their language but also in their manners and customs and ways of life in general. Hindi as a common language will bring them clo er together politically, socially, culturally and in many other respects. It will indeed be a cementing force. A note of warning, however, needs to be sounded here. Those living in non-Hindi regions are to be educated through their own regional languages and they should learn Hindi only as a means of direct communication with a large section of their fellow men leading to the broadening of their sympathies and helping them to develop a truly inter-state outlook.

Place of Hindi in the Curriculum

Keeping the above objectives in view, we may determine the place of Hindi in the curriculum of the Basic school. Two things must be made clear from the stant, *first*, Hindi as a national language, as defined in the foregoing paragraph, is to be treated differently from Hindi as a regional language; next Hindi as a regional language must be considered on a regional basis while Hindi as a national language must be studied on an all India basis. One (regional Hindi) will be studied as a mother tongue; the other, as a second language. The study of the first will comprise a study both of language and literature, while that of the second will be limited to a study of language only. The first, namely Hindi as a mother tongue, will be taught in its own region like any other of the thirteen languages recognised in the Indian Constitution in their respective regions. But unlike any other language, Hindi will be compulsory for all, for pupils belonging both to Hindi and non-Hindi speaking areas. Consequently, the study of

both types of Hindi cannot start simultaneously for all classes of pupils. Those whose mother tongue is Hindi will begin from the first grade, while those who have some other language as a mother tongue will have to defer the study of Hindi as a national language until they have made some progress in their regional language. The period intervening between beginning the study of the mother tongue and of the national language, Hindi, should not ordinarily be less than three years. And the courses of studies for the Hindi and non-Hindi speaking pupils will naturally be different—that for the former being of a higher standard than that for the latter. The details regarding the standard to be achieved, the length of the course and the number of teaching periods in the time-table should be settled by proper authorities. What we are concerned with is mainly to indicate the method of teaching Hindi as a national language.

Teaching of Hindi as a Second Language

In learning a language there are three processes: (a) speaking; (b) reading; (c) writing. A child learns his mother tongue through these processes and, as far as practicable, the same processes should be followed in teaching a living language like Hindi to those whose mother tongue it is not. In the study of Hindi, the first process should be *speaking*. Children will have to learn and practise speaking not at home, but at school, where proper arrangements must be made for teaching the subject.

The Teacher

The importance of selecting the right type of teacher for this purpose can hardly be over emphasised. In the first place, he must be one who has a very good command of Hindi. Secondly, he should have received special training for the job. In teaching, it is not enough to have a knowledge of a subject; the teacher must know how best to impart the knowledge concerned. That means he must have a sound knowledge of modern methods of teaching.

Oral Practice

In view of the importance of speech it is necessary to devote sufficient time to oral pra tic . This includes both hearing and speaking. The teacher must converse with the pupils on familiar objects, as much as possible, without using the mother tongue. The same words may be repeated in different sentence-structures until they are fixed in the child's mind and he begins to understand them correctly and use them himself. The verb-forms may be taught by illustrating them with a demonstration of the actions expressed by the verbs. Constant practice in hearing and speaking will render it easier to learn the language.

Another device that may be used to develop correct speech habits is what is known as the linguaphone. This is a recent innovation, but it has proved very useful in learning modern languages. Linguaphone records serve to introduce a familiar language to the class. These records create the right atmosphere and provide both entertainment and stimulation. By constant repetition, the child assimilates what he hears and acquires the skill of perfect pronunciation, intonation and rhythm. Suitable Linguaphone Language sets in Hindi may be prepared and their use popularised in schools.

The Reading Process

When appreciable progress has been made in understanding and speaking Hindi, the beginner should be introduced to the reading process. The first step in this direction is the recognition of the letters of the alphabet. There should be a series of charts, primers, and readers for the earlier stages.

A few important principles should, however, be kept in view in the preparation of the charts and books in Hindi. We shall treat the two items separately.

The Use of Charts in Teaching the Alphabet

The old method consists of starting straightaway with the letters as they occur in the alphabet, grouped together in various vargas (classes), named after the first letter of a group, e.g. कवर्ग चवर्ग etc. Generally, recognition of the letters, the writing of them in the same order concomitantly with the reading of them from a primer are calculated to prove ineffective to the beginner. Besides being dull and difficult it takes an unnecessarily long time and thus hampers the progress of a child eager to learn more and more in less time. This method must be discarded and, as a rule, writing must not start until the letters have been fully recognised and some progress has been made in reading.

The modern method requires the use of illustrated charts, pictures and simila devices. The child's interest is roused and sustained, when familiar objects are presented to him by means of multi-coloured charts containing in bold letters the names of the objects represented. He associates the words with the objects and unconsciously learns to pronounce them and recognise the letters constituting the words in their written form. The process is easy, interesting and time-saving. But so far as the teaching of Hindi as a national language is concerned, the preparation of the charts requires a little more care. It is not any and every word beginning with a particular letter, say कमल with क or मदरा with म, that may profitably be represented on the chart. Since it is intended to teach the language to pupils speaking different tongues, both in north and south India, the choice of words to be represented on the chart should be carefully made. A thorough investigation by a team of experts speaking different modern India languages—preferably one person speaking or being familiar with more languages than one—will reveal that there are many common words, maybe with slight modifications in some cases, found in a majority of the Indian languages. Such words should be chosen for representation on the chart or charts in preference to others. Secondly, as far as practicable, simple words formed by the combination of letters without *matras* (vowel-symbols), would be chosen. For instance, in selecting a word beginning with the letter क, it would be better to select कलम or कमल ra her than कटोरा or कबूतर, although both the groups of words may be more or less equally familiar. The picture and other devices should correspond to the charts.

When the children have learnt to recognise the letters of the alphabet, words involving the use of *matras* should be presented, both through

a chart and a primer, the same words occurring in both, in short sentences. The chart and the primer should be so carefully planned and prepared that there is enough practice with each vowel, first singly and then in combination. The knowledge of the *matras* acquired by the children through a study of words as a whole may afterwards be systematised by explaining the (द्वादशाक्षरी), that is, the twelve forms of each consonant in combination with different vowel-signs.

Writing

After sufficient practice has been acquired in speaking and reading, attention should be paid to writing. It is not necessary that the practice should start with single letters. Whole words, already familiar, may be imitated from the chart, the blackboard or the primer, as the case may be. But it is necessary that the words, presented at the beginning, should be made up of letters easy to write, e.g. letters formed with comparatively simpler strokes, horizontal or vertical. A special chart may be prepared for the purpose. Although the processes of speaking, reading and writing have been treated separately, it is never intended that they should be separated into watertight compartments. It is all a question of emphasis. What is suggested is that at the beginning greater attention should be paid to oral practice and in due course, the emphasis should be evenly distributed over speaking, reading and writing.

Textbooks

What has been said above relates in the main to oral teaching or teaching by means of charts and corresponding primers. But with due progress made in reading and writing, textbooks will be necessary and these will have to be carefully planned and prepared according to a scheme that may define the length of the course. A series of graded textbooks should be prepared and the words to be used classified, those of the highest frequency being used in the books for the lowest classes and those of comparatively less frequency being added in the books for higher classes. An effort should be made to repeat the words as often as possible in the whole series of the books.

As the books under contemplation will be used by the children whose mother-tongue is other than Hindi, every care should be taken to make them as simple as possible. In fact, simplicity should be the watch-word of these books. This may be ensured by observing a number of principles both with regard to the nature and form of words. Some of these are indicated below.

In the first place, there should be no attempt to boycott words of other languages, Indian or foreign, that are commonly spoken and understood in Hindi-speaking areas.

Secondly, with regard to the words of Sanskrit origin, the aim of simplicity will be attained by freely using the common *ardhatatsam* (अर्द्धतत्सम) or *tadbhava* (तद्भव) forms of words instead of the original or *tatsam* (तत्सम) forms. The former may be used as the latter with equal force of meaning e.g., अचरज for आश्चर्य, काम for कर्म, सूरज for सूय or सूर्य, चांद for चन्द्र, रात for रात्री, आद्य, for अर्द्ध मोर for मयूर and the like.

Thirdly, the use of compound words should, for the most part, be avoided and two words written separately (with proper case-endings, where necessary), even though under the rules of *Sandhi*, they may be joined together to form a compound word (समस्तपद) so frequently used in high Hindi. For instance, the expressions परम आवश्यक अन्न का अभाव, आदि से अन्त तक are to be preferred to परमावश्यक अन्नाभाव and आघात respectively.

Fourthly, the desired simplicity may be achieved to a very great extent by adopting the simpler forms of words in preference to more difficult ones used optionally in accordance with the rules of Sanskrit grammar. A few instances are cited below by way of illustration :

(a) With regard to the use of *annasikvarnas* (अनुनासिक वर्ण) the rule permits the optional substitution of *anusvara* (अनुस्वार) for them ; गङ्गा=गंगा, चञ्चल=चंचल, पण्डित=पंडित, दन्त=दंत, कम्प=कंप, सम्बन्ध=संबंध. If this use of the *anusvara* is uniformly adopted in the National Language books, a great hurdle of the beginners will have been surmounted and they will not have to scratch their head or rack their brains as to which *anunasik* they should use with which word and be always in doubt whether they have written a word correctly. The rule also permits the optional use of *anusvara* for the *anunasik* sign *chandra-vindu* as हँसना=हंसना, पाँच=पांच etc. It would appear, therefore, that a uniformity in the writing of words, as indicated here, is highly desirable.

(b) The rule of Sanskrit grammar permits the optional use of single instead of double letters in most words carrying a *raiph* (रेफ) above them : e.g., कर्म्म—कर्म, सूर्य्य—सूर्य etc. It is preferable to use single letters instead of double uniformly.

(c) There are two systems in the writing of words ending in the vowel sounds represented by the letters इ and ए; e.g., गयी, गई; लिये, लिए; चाहिये, चाहिए; गये, गए etc. It is admitted by standard grammarians and lexicographers that both forms are correct, still there is no uniformity in the writing of such words and it is common to find both forms used promiscuously in one and the same book. For facility and simplicity in writing, it is desirable that the forms of words should follow the sound, represented by the vowels and instead of taking the forms यी and ये.

(d) Since the final *akarant* (अकारांत) letters in Hindi words are always pronounced as though they were *halant* (हलंत) the practice of writing Sanskrit words with *hal* (हल) may be simplified by providing the use of *hal* as in, अर्थात for अर्थात् ; भगवान् for भगवान etc. Likewise the use of *raiph* in words of languages other than Sanskrit may be avoided for the sake of simplicity and ease by writing full instead of the *raiph* as सरदी for सर्दी; गर्मी for गरमी ; सरदार for सर्दार etc.

The Content or Subject-Matter of the Texts.

After so much has been said about words and their important aspects in reading and writing, we must turn to a more serious consideration in

Language Teaching, viz. the content or subject-matter of the texts. When once the period over which the teaching of *Hindi* as a national language is to extend is decided upon and the vocabulary deemed necessary for normal purposes is drawn up, the number of Readers in the series of books to be prepared for use as text-books may be determined and the subject-matter proportionately distributed to them with due regard to the age and mental capacity of the children from stage to stage. But two important principles must be kept in view in the selection of subject matter for books.

In the first place, since the books will be used all over the country—in all states differing from one another not only in language, but in manners and customs, art and culture and so many other things—it will not do to restrict the topics of the lessons to what may be found of interest in any one state but they must judiciously include some topics of interest to each state so that the pupils, from the beginning, may be introduced to the habits, customs, history, society and culture of the people living in different states and thus a natural sympathy may spring up among them for one another and this may ultimately result in creating a sense of national solidarity among students belonging to different regions.

Secondly, the Readers and the lessons in each Reader must be carefully graded in respect of words, phrases and sentence-patterns. At the end of each lesson, the new words used in it should be listed for the purpose of intensive drill. Some selected questions demanding in familiarity with the lesson and the ideas dealt with in it should also be given for oral and written exercise in grammar and composition.

Intensive and Extensive Study

So far as very little children—like those in the lower grades—are concerned, intensive is of far greater importance than extensive reading. The child should be taught a little at a time but as he progresses, his concern should be not only to read new lessons but also to review the previous ones lest he should forget the latter and be none the better for his apparent progress. He may well form a habit of going through every day what he has already read from the beginning up to the point where he has to take a new lesson. The daily repetition of learnt things will not be possible in the higher classes where the child will have to read a larger number of books in several subjects, but even there as much intensive reading as is possible or convenient must be practised until the child's burden is too great to enable him to carry it any further.

And then he will have to devote himself to extensive reading leading to an enlargement of his vocabulary and a widening of his mental horizon. For this purpose supplementary reading materials will have to be provided—books to be read in school and at home. These books must be much easier both in respect of language and matter than the textbooks so that the children may read them with interest without any external help. There must be a large number of them, a graded series, suitably collected in class-libraries, and all facilities should be available to the pupils to borrow them for studying at home. Some arrangements must be made to create an interest in the study of these supplementary books and to ensure that they are really studied.

A word about the content of these supplementary books may not be out of place. Books for the beginner may contain fables, animal stories and popular tales (some of them preferably in verse), but later, with the child's greater maturity, things of real human interest calculated to give both pleasure and information must be included in the books, such as biographies of eminent persons belonging to different states of the Union, places of historical and geographical importance and customs, manners etc.

Memorisation.

Memorisation is a very important aid to the learning of a language. But what shall the child to memorise ? It would be a nice thing indeed if a collection of moral teachings unrelated to the religious sentiments of any particular sect or community were made from the works of great Hindi poets, like Tulsi Das, Sur Das, Kabir Das, Rahim and others, and classified in order of difficulty for the different classes to which the teaching of the national language extends. The children might be encouraged to get by heart the lines of poetry intended for their respective classes, and with a view to making them retain those longer in their memory, the system of competiton known in Hindi as *antakshari* may be organised in each class and made the regular feature of a weekly programme of educational entertainment. A record of winners in the competition may be maintained and their success rewarded in some suitable form.

Grammar and Composition

Functional rather than formal grammar should be taught. Verb-forms may better be taught by oral practice and oral explanations, if and when necessary. No stress should be laid on the learning of definitions or detailed rules of grammar. What is desired is that the child should learn to understand, speak, read and write the language correctly after a study of it for a fixed number of years. This is possible without a detailed study on textbook of grammar, provided the teacher during the course of teaching the textbooks or guiding the study of supplementary books takes care to explain any peculiarities of grammar that the child must know fully to grasp the formation of words or construction of sentences etc.

One stumbling block in the way of the student learning Hindi is the gender of Hindi words. There are rules for the gender of words denoting animate objects and they may be mastered with effort ; but the gender words denoting inanimate objects can best be learnt by hearing correct speeches in Hindi or by studying books with attention. For this purpose, it will be useful to prepare a booklet containing all the names of inanimate objects with their genders indicated and illustrated by short sentences. The child should consult this booklet as often as necessary and avoid mistakes in writing and speaking.

There must be enough practice in composition, both oral and written. The composition exercises should first be very simple, for instance, answering questions about things seen or read in books, giving an account of any event, reproducing a story heard or read etc. At higher stages, children may be asked to write longer narratives, letters, personal experiences etc. The child whose mother tongue is a language other than Hindi

may profitably be sometimes asked to translate a passage from his own mother tongue into Hindi, and vice versa.

Examinations

The questions set at examinations must be determined by the aims of teaching Hindi as a national language, as indicated in the above lines and must not be on the lines of questions set in the mother tongue. In addition to a written test, there should also be an oral test.

CHAPTER VIII

PHYSICAL EDUCATION

In the following pages, certain activities and exercises have been suggested with a view to helping teachers of Basic schools to direct the physical activities of children in order to build their bodies.

First, such activities have been defined and classified in a general way. Then specific programmes of physical education have been outlined for each grade of a Basic school indicating how a particular activity should be carried out.

NATURAL ACTIVITIES

Introductory

Walking, Running, Skipping, Hopping, Galloping, Jumping, *Throwing*, Climbing, Hanging etc.

1. *Walking*: Emphasise good carriage, natural arm action.

   (a) *Slow walk*: Suggest characters like persons or various animals with a load.

   (b) *Heavy walk*: A tired person's walk ; a large person with a heavy tread.

   (c) *Brisk Walk*: Walking for speed ; suggest hurrying to the school, playfield, home etc.

2. *Running*: Emphasise spring, lightness, ease and economy of movement ; forward inclination of the body, arms slightly bent and swinging naturally.

   (a) *Running on the spot*: Start slow running. Gradually increase speed with high knee raising.

   (b) *Running with high knee raising*: Keep the body erect and raise the knees as high as possible. Short steps to be taken.

   (c) *Running backwards or sidewards*: On signal run forward, backward or sidewards.

   (d) *Running for speed*: Run on toes, (correct use of the ankle and strong push forward from the ball of the rear foot) with a forward body leaning position, and straight leg action.

3. *Skipping*: Emphasise spring, lightness and bounce, high or low.

   (a) *Skip jump on the spot*:—Spring lightly up and down on alternate toes on the spot without a pause between the movements.

(b) *Skipping:* Repeat skip jumps advancing forward, with a light easy spring and a good poise of the body. Arms almost straight with the movement chiefly taking place from the shoulder joint.

Hopping: (a) Hopping on the spot. (b) Advancing

(*i*) With high knee raising

(*ii*) With leg raising forward

(*iii*) With leg raising backward

(*iv*) With leg raising sideward

Emphasise high spring and a strong upward push from the ball of the foot.

Galloping: A step is taken with either foot and the other foot being drawn up to it with a little spring. The heels should touch lightly as the heels come together. This can be done forward or sideways.

Jumping: Emphasise spring and lightness, correct use of foot and ankle and a sense of rhythm.

(*i*) *Skip-Jump:* (as in skipping)

(*ii*) *Astride Jump:* A light with feet astride and together alternately.

(*iii*) *Upward Jump:* Jump for height on the spot to develop spring and to practice light landing.

(*iv*) *Forward Jump:* Jump with knees bent, body inclined forward and arms carried back. Swing arms forward as a spring is made for the jump. Emphasise height more, in the jump.

(*v*) *Sideways Jump:* The jump is taken to the right or left.

(*vi*) *Crosswise Jumps:* Alight with feet crossed in front alternately. Position of feet for the next landing should be changed while in the air.

Throwing: Emphasise the skill of throwing for distance and height; practise for accuracy and power.

(*i*) *Under-arm throwing:* Simple movement, including swing of the throwing arm backward and forward at the side of the body with the palm facing upwards as the object leaves the hand.

(*ii*) *Over-arm Throw:* The movement is much more difficult involving action of the back, shoulder and arm. Encourage the natural movement, with all the weight put in the movement in the initial stages but as skill develops the finer action of hand and wrist will come automatically. Let the children practise throws with either arm for proper and even development.

Climbing and Hanging

Use the ladder-horizontal, vertical, jungle, gym, giant stride, see-saw ladder, etc.

The teacher should check the apparatus for purposes of safety, and should give instructions to pupils regarding their proper use.

Body Building Exercises

(*a*) *Fundamental Positions :*

(*i*) *Standing at ease :* Keep feet apart in a comfortable position with the body weight equally distributed.

Verbal command: "Feet apart—jump".

(*ii*) *Standing Erect :* Although the command of "Attention" is not given, children should be instructed in good carriage involving, erect body, head held high and straight knees. Use verbal commands for getting them to "Attention", such as "Feet together—jump".

(*iii*) *Cross-legged sitting :* Keep the back and head erect. Hands can be kept either on the knees or holding the toes.

(*iv*) *Crook-sitting :* Keep flat on the ground with knees bent and drawn up-grasp below the knees.

(*v*) *Long sitting :* Legs stretched out in front and knee together. Variation—keep the legs wide apart.

(*vi*) *Kneeling* : Feet stretched back, knees apart resting on the ground, body and head held erect.

(*vii*) *Prone Kneeling* : Same as kneeling, except that the hands touch the ground, with the body held in a horizontal position. Emphasise a straight back.

(*viii*) *Lying with face upwards :* Lie flat on the ground (heels, back and the head touching). Emphasise pressing the waist and back of neck to the floor.

(*ix*) *Lunging (Forward) :* Place one foot forward at a comfortable distance with the front knee bent. Head and back should be in a straight line.

(*x*) *Lunging (sideward) :* Same as above except placing the foot sideways.

(*xi*) *Toe-touching from standing position :* (forward, sideward and backward) Place the toe of either leg in front, sideways or backwards as far as possible, with the ankle and knee well-stretched. The foot carrying the body weight should be kept straight. Keep the head and body erect.

(*xii*) *Crouch sitting with finger support :* Sit with knees apart and heels raised and kept together. Place the fingers in front on the ground between the knees. Back and the neck should be kept straight.

(*b*) *Exercises Informal :*

Head movements : In the initial stages of training, all exercises involving head movements should be done from a sitting position, to ensure only

the movement of the head. Emphasise a still and erect body and a full stretch of the back of the neck.

(*i*) *Head Dropping Forward*: Position: Cross-legged sitting. Drop the head forward as far as possible with chin drawn in and touching the chest.

(*ii*) *Head Dropping Backward*: Position: kneel sitting.

First take the kneeling position and then sit on the heels. Lift the head up and press the back of the head as much as possible.

(iii) *Head Turning*: (from side to side) Keep the back of the neck straight and turn the head from one side to the other in one complete movement in the forward position.

(iv) *Head bending sideways*: Bend the head on one side as far as possible and then to the other side without turning the head.

(v) *Head Rolling*: Move the head loosely in a circular fashion through side, back and front positions.

Trunk Bending Downward

In the initial stages, encourage natural bending and dropping the head and arms, thus ensuring complete relaxation in the different parts of the body.

(a) *Trunk bending downward from standing position to touch the ground*: Feet slightly apart. Bend the trunk forward, downward and try to touch the ground with the fingers, keeping the knees straight all the time; come back to the standing position.

(*b*) *Trunk bending downward to grasp ankles*: Feet astride position. Bend downward with chin drawn in and grasp the ankles. Keep the knees straight. Come back to the standing position.

Note: Distance between the feet can be altered to make the movement easier or more difficult.

(c) *Trunk bending downward—to grasp one ankle with both Hands*: Position: one foot slightly advanced. Same as above, except grasp one ankle with both hands at a time; come back to standing position.

(d) *Trunk bending forward*: Position—place hands on hips and feet slightly apart.

Bend the body forward from the hips so that the back and the head are in one straight line.

(e) *Trunk bending forward downward from long sitting position*: Bend the body forward downward so as to catch the toes with the hands and draw the chin in. Keep the knees straight. Come back to long sitting.

Arm Exercises.

The arm exercises are important for developing a good posture by strengthening the muscles of the arms, shoulder and neck. Only stretch-

ing arms sideways, midways and circling of the arms may be introduced in the earlier stages, as the other difficult arm movements may do more harm than good.

(*i*) Single arm circling

(*ii*) Arms raising in various directions and lowering

(*iii*) Raising arms forward, sideways and midways.

Leg Exercises

Leg exercises should be included to strengthen the leg and abdominal muscles, with a view to developing poise and good carriage.

From Standing Position

(*i*) Heels raising

(*ii*) Heels raising and knees full bending (keep the body erect and to enable this start with one foot slightly advanced in front).

(*iii*) Knee springing—while in the full knee-bent position.

(*a*) Hopping on the spot, forward, sideward or backward (for better balance support the knees with the hands).

(b) Walking forward with small steps.

(*iv*) Feet astride to alternate knee bending.

(*v*) Feet placing astride and together.

(*vi*) Knee raising. Keep the thigh parallel to the ground with toe pointing downwards.

(*vii*) Support the leg and raise the knee as high as possible and touch the knee with the forehead.

(*viii*) Hold the foot in front, or behind with hand.

(*ix*) Leg raising forward, sideward, backward (for balance raise arm sideways).

Crouch Position.

Leg stretching sideways.

Living on the Back.

(*i*) Bending one knee with the support of both arms and press it against the body.

(*ii*) Bending both knees as above.

SPECIAL ACTIVITIES: These should be introduced with a view to developing the skills in the natural activities. Besides, these practices will develop speed, agility, alertness, pluck, determination, perseverance etc. It assists cooperation and competition in groups on right lines.

(*i*) Running

(*ii*) Skipping

(*iii*) Jumping

(*iv*) Throwing

(*v*) Catching

(*vi*) Marching

(*vii*) Rhythmics

(*viii*) Easy agility exercises

(*ix*) Students and self-testing activities.

Recreative

The purpose is to provide vigorous and enjoyable activities that will develop bodily skills and promote physical fitness. The joy of spontaneous participation and the enjoyment of freedom are the most redeeming features of this part of the lesson. They also have educative values.

(*i*) Small area and low organisation games

(*ii*) Rhythmics including fundamental rhythm, singing games, simple folk dances etc.

(*iii*) Story plays

(*iv*) Mimetics (Imitation of)

Hiking, camping, scouting, swimming etc., should receive special attention and time should be allotted to the promotion of these activities.

Grade I

I. Introductory Activities

1. Free running. 2. Follow the leader. 3. Run and touch objects. 4. Running with a partner. 5. Jump on the spot. 6. Hopping on the spot on the foot. 7. Shipping. 8. Gallopping. 9. Imitations of duck, rabbit and frog. 10. Running on the spot and raising knees. 11. Walking, change to brisk walk, heavy walk etc. 12. Chasing with partners.

II. Informal Exercises

Trunk, arm and balance exercises to be done informally. Emphasise good fundamental positions.

1. *Stand-at-ease*: Feet apart jump—feet together jump—(Attention). 2. Cross-legged sitting:—touching the left and right knee with forehead. 3. Crouch down; jump up to standing position. 4. Rabbit hop. 5. Frog jump. 6. duck walk. 7. Walk on tip-toe and at signal sit crosslegged. 8. Skip jump on the spot. 9. Hop on both feet on the spot and move forward, sideward backward etc. 10. Run, skip, gallop anywhere and at signal stop on one leg with arms stretched sideways. 11. Swing like trees in the wind. 12. Giant strides—walking with very long steps. 13. Going upstairs—walk with knees high, turn round and run back and jump to line to depict last step. 14. Imitate wood cutter, dhobi, sawing wood, automobile, aeroplane etc. 15. Long sitting with legs side apart. Bend down to touch knee with the forehead. 16. Windmill—single arm circling with partner. 17. Lunge—with both hands on the knee and circling the other arm. 18.

Feet astride—trunk bending to grasp ankles. 19. Threading the needle. 20. Hugging knee from standing position.

III. Special Activities

1. Free running, quick changes between forward and backward running. 2. Free skipping, change to skipping with partner. 3. Threes join hands, the centre child skipping, whereas the outer run. Change to the centre position on signal. 4. Corners change and marking time with high knee raising—no uniformity required. 6. Marching on toes, forward, sideways or backwards. 7. Heel marching for short period. 8. Jumping on, off and over lines. 9. Run and jump over marked spaces. 10. Jump over Indian clubs and run back by the side to the starting line. 11. Jump the fish, a small brook etc. 12. Ball or been bag toss. 13. Bounce and catch. 14. Throw ball to partners. 15. Simple forward roll. 16. Running up the playground to touch suspended objects. 17. Throwing over a high rope. 18. Rolling the ball between Indian clubs. 19. Tossing a ball against wall and catching it with either hand. 20. Tossing up the ball with one hand and catching with the other.

IV. Recreative

1. Keep the basket full. 2. Running after the balls thrown by teacher in all directions. 3. Simple tag. 4. Couple tag. 5. Circle chase. 6. Free and caught. 7. Dog and the bone. 8. Train. 9. Whip tag. 10. Hop scotch. 11. Inge Va. 12. Black and white or crows and cranes. 13. Farmer and the ducks. 14. Woodcutter and the axe. 15. Hunter and the Pigeon. 6. Visit to the Zoo. 17. Singing Games. 18. Simple folk dance. 19. Wild Horses. 20. Tiger and sheep.

Grade 1

LESSON No. 1

I. Introductory

1. Free running and on signal stop. Repeat several times. 2. Free running and on signal, take a partner and run. 3. Free running and on signal, jump on the spot. 4. Walk back to the original starting line.

II. Informal (Exercises)

Free formation. Let children stand scattered on the play field, without coming into contact with their neighbours. Teacher should stand at a place from where he can be seen and heard clearly.

(a) (i) Crouch down and jump up to standing position.

(ii) Feet astride. Trunk bending to grasp ankles.

(iii) Cross-legged sitting : Touch the knees with the forehead. (Let children touch one knee first and then on signal touch the other)

(b) (1) Walk on tip-toe and on signal, sit cross-legged.

(2) Free running and on signal, stop on one leg with arms stretched sideways. Change to skipping, galloping etc.

(3) Sway like trees in the wind. (Keep the arms half-way raised up.)

III. Special Activities

(1) Free running, and on signal, run forward, backward, sideward as suggested by the teacher.

(2) Three children join hands, with the middle child skipping whereas the outer ones run. Change to the middle position on signal. Repeat to give all a chance to be in the middle position.

(3) Jumping on off and over lines.

IV. Recreative

(1) *Keep the basket full* : Equipment : A basket, number of small rubber or wooden balls. Place the basket in the centre of the playing area. Teacher should roll the balls in all directions whereas children should retrieve them and put them into the basket again. Teacher should try and keep the basket empty and the children should try to keep the basket full.

(2) *Farmer and the Ducks:* Fix the boundaries for the game. Teacher to act as the farmer and pupils to be the ducks for feeding them. Ducks approach the farmer with duck walk and making "quack, quack" sound. When the ducks come very close to the farmer, the farmer should suddenly try to catch one or two ducks. Explain that on signal, all children should run back to the boundary lines where they cannot be caught.

(3) *Visit to the Zoo* : Narrate and enact all incidents on the way to the zoo and imitate animals and birds seen there. Going by bus. or train, walking briskly upto the Zoo etc. and imitations of animals like elephant, monkey, tiger, bear and any other animals, birds etc. could be done.

LESSON No. 2

I. Introductory

(1) Run and touch objects. Change to skipping, hopping, galloping etc.

(2) Hopping on the spot on one foot.

(3) Chase and touch the teacher or a coloured scarf held by him.

II. Informal (Exercises)

(a) Feet apart jump, feet together jump. (Refer to the fundamental positions)

(1) Rabbit hop, frog jump etc.

(2) Skip jump on the spot and crouch down. Repeat.

(3) Going upstairs—walk with knees high and turn round, run back and jump to line to depict last step.

(b) (1) Follow the teacher on tip-toe, and when the teacher looks back, stand like a statue or sit down as suggested.

(2) Giant strides—walk with very long steps.

(3) Windmill—single arm circling with partner.

III. Special Activities

(1). *Corners change* : Have four different groups in four corners of the playing area. Each group does one activity, e.g. running on spot, rabbit hop, jumping on spot, duck walk etc. On signal they change places and continue doing the new activities until each group finishes all the four activities.

(2) *Jump the fish* : Draw an outline of a big fish.

Let children jump first over the tail, then the head and finally the broad part of the body.

(3) *Running up in the playground to touch suspended objects.*

Tie several objects on a rope held by two boys standing on chairs or stools.

IV. Recreative :

(1) *Free and caught* : Select two or more pupils to be the "Its" On signal, they chase and touch any of the players running within the playing area. Those touched by the "Its" should stand still, until they are touched and brought into play by any one of the free players. The object of the "Its" will be to get as many as possible standing still, while all the free players shall try to prevent it.

(2) *Ingeya* : Fix the boundaries of the game. Let all the children except one stand on one side of the line. The "It" stand in the centre of the field and shouts "Inge Ya." Children should run and cross over to the other side without being touched by the "It." Those touched by the "It" before they reach the safety line would join in touching the other players when the game is continued.

(3) *Hunter and the pigeon* · All children act as pigeons, run about with arms fluttering, suddenly settle down in a field where the hunter had placed his net. On seeing that they are all caught in the net, the leader of the pigeons advises them to lie like dead birds when the hunter comes on the scene. The hunter, taking the birds for dead, removes the pegs and frees the net, and all pigeons suddenly fly away with the net. After running some distance they get freed from the net. Narrate the story and get it enacted by students with suitable movements.

LESSON NO. 3

1. Introductory :

1. *Follow the leader* : The leader to stand at the head of the line. He does various activities like running, skipping, gallopping, jumping etc. The rest of the group do the same.

2. Start from a line with duck walk and return with frog jumps.

3. Slow walk. at signal, change to brisk walk ; finally run back to the starting line.

4. Free running, with the object of covering as much play area as possible but without coming into contact with other pupils.

II. Informal (Exercises)

(a) "As tall as possible, as small as possible". Jump up high with arms stretched upwards from the crouching position to become as tall as possible and crouch low down to become as small as possible.

(2) Sitting with legs wide apart. Bend down to touch the knee with the forehead.

(3) Woodcutters or Dhobi's actions.

(b) (1) *Threading the needle* : Clasp your hands in front, lift one leg and pass it through the clasped hands. Repeat the same with the other leg.

(2) *Variation* : Keep the sole of the foot on the clasped hands and hop on the other leg.

(3) Run anywhere on the ground, at signal hold any foot behind with the hand.

III. Special Activities

(1) Bean bag toss and catch. Each pupil to have a bean bag which he should toss up and catch. Try for various heights.

(2) Rolling a ball between Indian Clubs. Place a row of Indian clubs at the centre of playing field and mark two lines on either side of the clubs at a reasonable distance. Give a ball to each boy, who should roll the ball through Indian clubs directly in front of them. The boys at the other end to gather the balls and roll them back through the clubs.

(3) Throwing a ball over a high rope. Either tie a rope to two posts or let two boys hold it while standing on high stools. Station boys on either side of the rope. Let one group throw the balls over the rope while the others attempt to catch and throw them back over the rope again.

IV. Recreative

(1) *Simple Tag*: Fix the boundaries for the game. Select one boy to be the "It". At signal he must chase and touch any of the other boys The boy touched becomes the "It" in turn.

(2) *Whip Tag* : Let children sit on the circumference of a circle that is already marked. Prepare a small whip with paper or cap or a big handkerchief. The "It" runs round the circle and drops it behind any one of the seated players, without his knowledge. If the player behind whom the whip was placed does not find it, the "It" will pick it up after completing one round and drive the seated player round the circle by hitting him with the whip till he takes his seat once again. If the player finds the whip earlier, he should pick it up and chase the "It" until the "It" takes his seat. The person holding the whip becomes the "It" and the game is continued.

(3) The *Woodcutter and the Axe*: Narrate the story and get it enacted with vigorous movements.

LESSON NO. 4

I. Introductory

(1) Free running, at signal jump as high as possible and continue running, change to brisk walk etc.

(2) Feet apart jump, feet together jump. Repeat several times.

(3) Heavy walk, walk like a tired man or like one carrying a heavy burden.

(4) *Steer the ship*: Divide the class into smaller groups. Let the leader stand in front of his group and others standing behind him in a file. The leader leads his group in running, skipping etc. without interfering with any other group on the playfield. Encourage leaders to cover as much ground as possible.

II. Informal (Exercises)

(a) (1) Walk on tip-toe, at signal stop or change to running on toes as suggested by teacher.

(2) Jump on the spot, going higher and higher at every jump. For variation indicate direction to which they have to change at signal.

(3) Lunge with one hand on the knee and circle the other arm. Repeat with the other arm.

(b) (1) *Hugging knee from standing position*: Raise one leg up by bending the knee, grasp just below the knee with both hands and touch the knee with the forehead. Repeat it with the other leg.

(2) Crouch sitting, at signal stretch one leg sideways return to crouch sitting; repeat several times on both legs.

(3) Free running or skipping, at signal stand on one leg with arms stretched sideways.

III, Special Activities

(1) Run and jump over marked spaces with increasing widths.
(2) Throw ball to partners—with a bounce, change to direct throws.
(3) Run to head suspended objects.

IV. *Recreative*: Mark a circle and let children stand around the circle with equal distance from one another. At signal, they run and try to overtake those in front. Those who are overtaken should go and sit inside the circle.

(2) *Jump the shot*: Take a sufficient length of rope and tie a ball to it. The teacher stands in the centre of the circle and rolls the ball along the ground around the circle. Each child to jump up as the ball nears him so as to avoid being hit by the ball.

(3) *Crows and cranes*: Fix the end boundaries of the playing area, divide the class into two groups and make them stand facing each other in the centre of the playing area at a distance of about six feet. Name one group, crows and the other cranes. Teacher calls out Crr.....owns, or cranes and the group bearing the name called out by the teacher should chase and touch the opponents until the end line. The opponents should try to reach safety zone without being touched. Those caught go over to the opposite side. Repeat the game several times and then declare the winner.

LESSON No. 5.

I. Introductory

(1) Run from one side of the field to the other. On the trip back, skip, gallop, or hop as suggested by the teacher.

(2) Keep the basket full (Lesson No. 1)

(3) Free skipping, at signal, take a partner and walk briskly. At the next signal, join hands with another couple and form a ring and continue skipping, or change to other activities as suggested.

(4) Free running, at signal run back to the line and stand in good position.

II. Informal (Exercises)

(a) (1) Crawl anywhere "like a cat", at signal stop in crouching position. Imitate an angry cat by keeping hands on floor and stretching knees to arch the back.

(2) *Crook sitting*:—Stretch the legs and return to crook sitting.

(3) Lying on back rub one knee first and then the other.

(b) (1) Run anywhere on the field, at signal stand like "statues."

(2) Free skipping, at signal sit on heels and place hands on knees and "crow hop" on the spot.

(3) Rabbit hop with longer hops, at signal straighten up slightly, with "ears up" to listen.

III. Special Activities

(1) Aiming at Indian clubs in pairs. Place an Indian club in the middle with two players standing on opposite side. One of them rolls the ball to knock down the club with the partner taking his turn alternately.

(2) Jump over a rope held about 4 or 6 feet above the ground. Land in a crouching position.

(3) Crouch jump moving forward (Rabbit hop) on reaching the centre of the field, get up, run back and jump as high as possible over the starting line.

IV. Recreative

(1) *Dog and the bone*: Draw two parallel lines at a distance of about thirty feet. Divide the class into two groups and make them stand on

the lines. Give numbers to each membeı of the group. Place an object, e.g. Kerchief, in the centre of the playing field. At signal, the number called by the teacher should rush to the object in order to snatch it back home without being touched. Emphasise feinting, and waiting for the right moment to snatch the object. Declare the winning team at the end of the game.

Variation : Place more than one object in the centre and call as "numbers" as the objects placed.

(2) *Tiger and sheep :* Divide the class into groups of eight to ten members in each group. Each group stands in a file formation with the leader standing in front with arms outstretched. Group members to hold the waist of the boy in front of him. For each group select an "It" who will act as the tiger. His group will move in any direction along with him, but they should not break the chain. At signal, the tiger tries to touch the last boy in the file. If he succeeds, the tiger becomes the leader of the group, with another "It" appointed as the tiger.

(3) *Hop Scotch Gold :* Draw about six to eight small circles within an area of about 30×30 feet. Number each of the circles. Fix a starting line. Provide each student with a disc either wooden or prepared out of tile pieces.

The class can be divided into groups and mark the playing area as above for each group.

A player must kick the disc into the circles marked in the serial order, from the starting line. The player has to follow up his short, hopping and counting the number of kicks required to make the disc land inside the circle numbered one. After having scored the first circle, try for the second circle once again from the starting line. The player to complete each circle or the complete course in the fewest number of kicks, is the winner for that particular circle or the whole game.

GRADE II

1. Introductory Activities

(1) Walking, running, skipping, gallopping, hopping etc. freely and with partners 2. Skip jumps. 3. Follow the leader, 4. Inge Ya. 5. Circle chase, 6. Imitations of bears, monkeys, giraffes, birds, etc. 7. Running and clapping to keep the rhythm. 8. Giant strides. 9. Corners change. 10. Jumping the book. 11. Steer your own course. 12. Keep the basket full. 13. Free running, at signal, follow the leader in maze running. 14. Here, there and everywhere. 15. Running, jumping to touch suspended objects. 16. Running through the arch. 17. Astride jumping, moving forward, backward etc. 18. Simple tag. 19. Jump the shot. 20. Keep the ball moving.

II. Informal Exercises

1. Running on the spot with high knee raising. 2. Running backwards or sidewards. 3. Crook sitting, and stretch legs one after another. 4. Prone kneeling. 5. Lunging forwards. 6. Greet the knee, toes etc.

7. Trunk bending forward. 8. Trunk bending forward downward from long sitting position. 9. Single arm circling. 10. Heels raising and knees full bending. 11. Hold the foot in front and behind with hand. 12. Hugging the knee from standing and lying down position. 13. Imitation of Kangaroo, elephant, etc. 14. Imitations of actions of fishermen, sawing wood, railway porters etc. 15. Place one hand on the ground and run quickly round it. 16. Crook lying and touching floor overhead with hands several times. 17. Crouch, knees stretching and bending. 18. Walking about clasping ankles. 19. Holding one foot behind and jumping round and round. 20. Jumping on spot turning while jumping.

III. Special Activities

1. Running in pairs with short steps and high knee raising. 2. Running to head objects suspended at increasing heights. 3. Running at signal jump and land in couch position with finger support, spring up and continue. 4. Walk with giant strides across playground. 5. Skip jump with rebound. 6. Skipping with partners and holding hands, at signal, change hands and direction and continue skipping. 7. Jumping marked spaces of increasing widths. 8. Jump the swinging rope. 9. Standing broad jump. 10. Jump ropes or objects of varying heights. 11. Free running, batting a ball in the air with hand. 12. Running in twos bouncing a ball from one to the other. 13. Throw a ball in the air and run and catch. 14. Hit the ball against a wall and catch. 15. Throw a ball to the partner with underarm action. 16. Bounce the ball across to the partner with overarm action. 17. Hopping with alternate knee raising. 18. Hoping, holding foot behind with opposite hand, change feet with a spring. 19. Hop and step alternately. 20. Hopping on the spot with high knee raising and alternate arm swinging.

IV. Recreative

(1) Cat and the mice. 2. Squirrels and trees. 3. Shadow Tag. 4. Magic ring. 5. Hitting players with a rag ball. 6. Giant's treasure. 7. In the pond on the bank. 8. Hopping tag. 9. Pluck the tail. 10. Soldiers and brigands. 11. Nose tag. 12. Namaste. 13. Sore Tag. 14. Relay games in rabbit hop, frog jump, crab walk, gallopping, skipping, duck walk etc. 15. Potatoe or stone race. 16. Blind man's buff. 17. Story play—Cap vendor and the monkeys. 18. Building a house. 19. Singing games. 20. Follow the leader.

Grade III

I. Introductory

1. Running, skipping, jumping, gallopping, hopping etc. 2. Free running, at signal, jump upward and turn about and continue running in the opposite direction. 3. Stand in two lines far apart, at signal, members of one line run round their partners in the opposite line and return to starting position. Repeat with the other team. 4. Running, jumping marked spaces. 5. Here, there everywhere. 6. Walk about briskly anywhere on the playground, on signal join hands with a partner and sit down. 7. Chasing partner from a double ring. Partners run in opposite directions, at signal those in inner ring chase their partners in the outer ring. 8. Change between running, in slower rhythm and walking. 9. Free

running, at signal several high skip jumps on the spot, and continue running. 10. Keep the balls moving. Place three or four balls and let the boys keep the balls moving by kicking, throwing, bouncing etc. 11. Ball scramble. Teacher throws as many balls as possible in any direction, children collect them. See who collects the most. 12. Skipping freely, at signal join hands with a partner and continue skipping. On the next signal, make fours and run to head a rope held overhead. 13. Crab walk-running sideways on all fours. 14. Reverse crab walk. 15. Lame dog—lift one leg up and move on two hands and the one foot. 16. Bear walk—on all fours, travel by stepping with the right and left foot simultaneously and then stepping with left hand and right foot simultaneously. 17. Kangaroo jumping. Place any convenient object between the ankles (Variation: Knees) and jump forward. Replace the object if it falls down. 18. Steer your own course imitating different vehicles. 19. Run on the spot and slapping the thighs, at signal, jump up as high as possible and continue running. 20. Free running, at signal, run to two or more marked lines. 21. Keep the balls up : Give two or three balls with the object of keeping them up in the air without dropping on the ground.

II. Informal (Exercises)

1. Cross-legged sitting, head dropping forward and stretching upward. 2. Cross-legged sitting : twist the trunk from one side to the other. 3. Crouch : hands not too near feet, run on the spot keeping hands still. 4. Cross-legged sitting, trunk bending downward to touch ground with forehead. 5. Lying face upwards position : hug one knee, quick leg changing at signals. 6. Lying position : raise head to look at your toes. 7. Kneel sitting, bend forward and touch knees with forehead and sit back on heels. 8. Kneel-sitting : Look round as far as possible by turning the head and the trunk. 9. Feet astride, trunk bending downward with hands as far behind as possible thrust through the legs. 10. Drawing the bow : feet close, arms forward with fists touching, with right arm draw the bow ; repeat with the other hand. 11. Feet together ; quick trunk and head turning with arms swinging to sideways position. 12. Lunging outward to touch the ground. 13. Thread the needle : Stand on one leg with hands clasped in front, pass the leg through the clasped hands without unclasping hands. Repeat on the other leg. 16. Thread the needle and hop round and round on standing leg. 15. Partners standing side by side with face in opposite directions, support each other by grasping at the shoulder. Stretch the outside arm and leg sideways. Emphasise straight knee, ankle and direct body. 16. Skip, jump on the spot low and high alternately. 17. Hopping on the spot with knee raised, changing feet at signal. (Teacher to give signals at specific intervals to establish rhythm) 18. Hopping on the spot with the high knee raising. 19. Hopping, holding foot behind, at signal change feet with a spring. Skip jumps on the spot ; moving forward, among sidewards (left and right)

III. Special Activities

Jumps : 1. Standing broad jump from circle to circle which are marked at suitable intervals. 2. Frog jump from circle to circle. 3. Sideways jumping over a low rope, partner helping. Partner stands astride rope and holds the jumper's hands. The jumper with some preparatory jumps on the spot, makes a high jump over the rope, landing with knees bent and standing up again. 4. Crouch, jump over a stick on to a mat.

Practices with ball : 5. Throw a ball to partner using under and over arm action. 6. Throw and change places with partner. 7. Throw and bounce alternately from one to the other. 8. Throw a ball against a wall and catch it on the rebound. Repeat. Variations—Clap once and at later stages more than once before catching the ball. 9. Throwing ball into a basket for accuracy.

Rhythmics : 1. Walk four steps forward and clap on the last step. Walk backwards four steps and clap on the last step. 2. Running forward four steps and clapping on the last step, running backward and clapping on the last step. Variation--Bend down and clap on the last step in both movements. 3. Step left foot forward, bend forward and clap, at the same time tapping the right toe behind the left foot. Next, step right foot forward. bend down and clap at the same time tapping the left toe behind the right. (This movement can be taught in two or four counts). 4. Step left foot forward bend down and clap at the same time tapping the right toe behind the left foot. Next step right foot forward, hips firm and tap the left toe behind the right foot at the same time. (This can be done either in two or four counts).

Self-Testing Activities and Stunts : 5. Forward roll. (mats to be used) Take a crouching position at the head of the mat, then touch the head well in and roll forward with the back of the head, neck and back touching the mat in that order. 6. Lead up to hand stand : Stand about 12″ away and with back towards the wall. Take the crouch position with hands support, then lift one foot, press it against the wall. Lift the other foot and press it similarly. Try to raise the feet as far up as possible. Keep the head up and arms straight, for safety practice in pairs. 7. Free practices in cartwheel.

Recreative

Minor games. 1. Squat tag. 2. Comic tag. 3. Chain tag. 4. Cat and rat. 5. Hop tag. 6. Two deep. 7. Circle Ball (Pass) 8. Dodge ball. 9. Find the leader. 10. Magic Wand. 11. Running circle catch. 12. What is the time Mr. Wolf ? 13. Zig-Zig running relay. 14. Hopping skipping, galloping relays. 15. Last couple out. 16. Bull in the ring. *Story Plays :* 17. Ali Baba and the Forty Thieves. 18. Circus.

Grade IV

Introductory :

1. Walking, running jumping, skipping hopping etc. 2. Run and touch various objects and return to starting line and stand in good position. 3. Free running, at signal form a ring. Free skipping, at signal, run to form four rings and continue skipping. 4. Free running, at signal, form files behind leaders in knee full bent position. 5. Skip, jump on the spot, four high and four low. 6. Free gallopping and circling the arms. 7. Astride jumps, at signal, crouch with finger support. 8. Steer the ship, turning about at signal. 9. Race across playground bouncing and catching a ball in pairs. 10. Keep the ball moving. 11. Chair Tag. 12. Squat Tag. 13. Maize running with various types of imitations. 14. Inge Ya. 15. Crows and Cranes. 16. Corner change. 17. Feet

astride, holding ankles and moving about. 18. Merry-go-round. 19. Giant strides across the playground. 20. In a loose group, jumping on spot, forward, backward, sideward etc.

Informal (Exercises)

1. Prone kneeling : Lift one arm up and look behind as far back as possible. Do it with the other hand. 2. Lean standing against a wall, swing one arm forward upward ; arms changing with forward swing. 3. Jump feet astride : arms upward bend—sink. 4. Feet astride : bend down and touch the ground with finger tips. 5. Stand with one foot forward ; grasp the ankle with both hands and touch the knee to the forehead. 6. Feet astride ; Trunk bending downward to grasp the ankles. Emphasise straight knee positions. 7. Stand feet together : Stretch the toe and ankle to touch the ground forward and sideways. 8. Stand with one foot forward, rise on toes and take full-knee bend position. 9. Crow hop : feet together, raise heels, come to full knee bending position, keeping the hands just above the knee and hop on the spot, forward, sideways etc. 10. Stand on one leg, hold the other foot in front, one hand catching hold of the toe and the other hand giving support at the knee. Hop on one leg. 11. Crouch with hand support, stretch one leg sideways with a springy movement. 12. Cross-legged sitting ; touching the knee with the opposite ear. 13. Free skipping, at signal stop on one leg with arm sideways. 14. Free running, at signal jump to crouch with finger support. 15. Free skipping, at signal stop on toes, knees full bent and crow hop anywhere. Hand up and repeat. 16. Duck walk anywhere, at signal, run to corner and stand up erect. 17. Free skipping, at signal, stop on one leg. Standing on one leg, bend down to touch toe with each hand in turn. 18. Bear walk anywhere, at signal, change to walking on toes. 19. Crouch jump, moving anywhere on the playfield. 20. Lying down on the back "bicycling".

Special Activities

Jumps : Astride jump—Heel clicking while in the air, land again with feet apart. 2. Hop and step alternately from circle to circle. 3. Groups standing behind leaders, run across playground, jumping centre line. Later, jump a marked space. 4. Run and jump over a series of obstacles and marked spaces. 5. Crouch jump over a low rope.

Practices with ball : 1. Throw a ball against a wall, clap the hands twice before catching it. 2. Throw a ball against a wall, turn round and catch the ball on the rebound. 3. Throw the ball against a wall, touch the ground with the hand, get up and catch it. 4. Walking circle catch. 5. Try and hit a target from a suitable distance.

Rhythmics : 1. Astride jumps, crouch with finger support on every sixth count, spring to astride position and repeat. 2. Skip jump on spot with rebound, two on the spot, two moving sideways. 3. Step left foot forward, bend forward and clap at the same time tapping right toe behind the left foot. Step right foot forward and hop on it, bringing the left leg forward in the air with hips firm. Repeat continuously. 4. Same movement as above, except clap on right side, instead of hands on hips. 5. Same movement but produce sound by flicking the thumb and the middle finger on either side, instead of clapping.

Self-Testing Activities and Stunts : 1. Forward roll. 2. Backward roll. 3. Cartwheel (free) 4. Handstand with support with three boys— helping ; two kneeling by the side and one supporting leg standing behind. 5. Walking on balance beam.

Recreative : 1. Touch stone tag. 2. *Sashtang Namaskar* tag. 3. Ankle tag. 4. Back to back tag. 5. Pinch-ho. 6. Go home. 7. Circle toss. 8. Club bowling. 9. Numbers change. 10. Puss in the corner. 11. Animal tag. 12. Blind hop tag. 13. Spoke relay. 14. Flag relay. 15. Hoop relay. 16. Bean bag arch relay. 17. Bounce and catch relay. 18. Dodge ball. 19. Simple spud. 20. Wild horses. 21. Informal touch *kabadi*.

Grade V.

Introductory :—

1. Walking, running, hopping, skipping, jumping, climbing, etc. in loose groups and in pairs. 2. Free running, bouncing over marked places 3. Running forward and backward in twos or fours. 4. Walk in a relaxed manner, change to brisk walking, jogging and running at top speed for a short distance. 5. Chain tag. 6. Keep the ball moving with one or two players to intercept. 7. Merry-go-round. 8. Follow the leader with running, skipping, walking, and spring steps. 9. Running in groups to head a rope stretched overhead. 10. Balls or bean bags scramble. 11. Dodge ball. 12. Frog jump or other animal run from circle to circle. 13. Free and caught. 14. Circle chase. 15. Pluck your partners tail. 16. Giant strides, continuous standing long jumps across playground and run back. (count the number of jumps required to cross the playground). 17. Inge Ya. 18. Jump the shot. 19. Running, jumping a series of ropes with controlled landing. 20. Steer your own course imitating various vehicles.

Informal (Exercises)

1. Skip jump on the spot with arm circling. 2. Lean standing, trunk bending, downward to grasp ankles. 3. Crook sitting : one leg straight, leg changing with hands at sides on ground. 4. Astride : trunk bending downward with rhythmic pressing to clap ground with hands. 5. Crouch, stretch one leg to the rear and then bend, to be done alternately. 6. Lying on back, lift each leg in turn as high as possible. 7. Crook sitting in twos ; feet touching, hands joined : trunk falling backward and forward alternately. Partners pulling each other in turn. 8. Feet astride : Trunk bending downward, with rhythmic pressing to touch ground with fingers and fists. 9. Lying on back, lift one arm and kick the hand. 10. Crouch jump on the spot, low and high alternately. 11. Feet together : full knee bend raising heels with arms sideways. 12. Free running, at signal, stand on toes with arms sideways. 13. Lean standing, arms swinging forward upward to touch the wall. each arm in turn, followed by both arms. 14. Arm bending and stretching sideways. 15. Informal lunge with hand support, single arm circling slowly and then quickly. 16. Step and lunge forward and to the sides with arms sideways. 17. Free running, at signal. thread and unthread the needle, stand up straight and hug the knee. 18. Informal lunge with hand support, single arm swinging forward, backward and circling twice. 19. Feet together ; stretch one leg forward, and to the sides with arm sideways. 20. Cross-legged sitting, hands on knees, quick

changes to astride long sitting.

Special Activities :

Jumps : 1. Informal practices in hop, step and jump. 2. Jumping over a series of low ropes, encouraging jumping as high as possible. 3. Jump from a height. (a chair, or table, low wall etc.) with a high spring and land in knees full bent position. 4. Standing spring jump ; try and reach as high as possible preferably against a wall. 5. Jump a swinging rope.

Practices with ball : 1. Running circle catch with and without centre player. 2. Throwing the ball under the leg against the ball and catching it. 3. Throwing the ball behind the back or shoulder against the ball, turn about and catch it. 5. Aiming practices ; Hitting partner with a bean bag or a small rubber ball. The partner runs anywhere, the player should chase him until he can hit him. Reverse the order. 5. Running circle basket throw.

Rhythmics : Hips firm : Tapping step. 1. Hop on the left foot four times and tap four times the right toe in front with the knee straight. Change the feet with a slight spring and repeat the movement. 2. Do the same movement sideways and backwards. 3. Crosswise step : With a low spring jump, land with right crossed in front of the left. Come back to feet together position, jump and land with the left foot crossed in front of the right. Repeat. 4. Revise the previous steps and add : Step left foot forward, bend forward and clap at the same time tapping right toe behind the left foot, step right foot forward, and hop on it, bringing left leg forward in the air and clapping overhead. 5. Hop on the left, bring right cross-wise in front in the air, clap on the left hand side, then hop on the right, bringing left crosswise in front in the air and clap on the right hand side.

Self-Testing Activities and Stunts : Revise the practices learnt already. 1. Cock fight. 2. Pulling contest : Stand toe to toe over a line catch hold of partner's hand and pull him over the line. 3. Running for speed a short distance. 4. Handstand against a wall with partner helping (only for a short time) 5. Free vaulting against practices with short lathis.

Recreative : 1. Touch hands and run. 2. Boiler Burst. 3. Poison circle. 4. Musical circles. (Poison area). 5. Snake catch. 6. Come along. 7. Couple tag. 8. Statue tag. 9. Ten steps. 10. Boundary ball. 11. Three court dodge ball. 12. Informal football. 13. Keep the ball up. 14. Corner spry 15. Bounce and catch relay. 16. Ball and rope relay. 17. Five pins. 18. Releasing the prisoner. 19. Tunnel ball relay. 20. Odd man. 21. Ground Ball.

SENIOR STAGE.

Grade VI.

Introductory Activities : 1. Walking, running, Jumping, galloping hopping, skipping, throwing etc. 2. Free running : from two miles well apart, gallop step sideways across playground, at signal, jump on the spot. At second signal, repeat in the opposite direction. 3. Two lines well apart, one standing astride. Opposite line races across, through partners

legs and back. Repeat with other team. 4. Here there everywhere. 5. Running, change to running with long springy steps, change to brisk walking. 6. Free running, alternately bouncing and throwing a ball from one hand to the other. 7. Free skipping. at signal making rings of given number. 8. Corners change. 9. Keep the ball moving. 10. Free running, at signal race to the starting line and do high knee marching. 11. Free galloping, at signal jump upward with about turn and continue running in opposite direction. 12. Leap frog pratice in twos : Vaulting over partners' back with hand support. 13. Chain tag. 14. Three court dodge ball. 15. Magic wand. 16. Continuous standing long jumps across the play-field. 17. Running practice with long steps, high spring. 18. Zigzag runinng relay. 19. Run to jump over a low rope and run to head a high rope. 20. Continuous leap frog in groups.

Formal Exercises : 1. Arms forward raising and arms sinking. 2. Arms sideward raising and arms sinking. 3. Arms upward bending and sinking. 4. Arms forward upward raising and forward downward sinking. 5. Arms sideward upward raising and sinking sideward downward. 6. Trunk bending forward with hips firm. 7. Trunk bending sideways. 8. Trunk bending down to touch ground. 9. Long sitting trunk bending downward to grasp ankles. 10. Long sitting with legs apart and touching the knee with the forehead. 11. Cross-legged sitting, arms under bend, trunk bending sideways. 12. Lunging outward to touch the ground. 13. Arms sideways full knee bend. 14. Hips firm, leg stretching forward, sideward and backward.

Indigenous Exercises :

I. Suryanamaskar

11 *Asanas :* (1) Bhujangasan (2) Ardha Shellabhasana (3) Bae Vakrasana (4) Dahina Vakrasana (Half fish poses).

Lezim : Fundamental positions and commands : (1) Char Thoka (2) EK Jagah (3) Adhi.

Marching Practices : Give commands for "Attention", stand-at-ease, turnings, numbering and stepping. Marking time and turnings on spot etc.

Special Activities

Jumps : 1. Practice in Long Jump. Encourage take off with one foot that is natural and convenient, height in air, and landing with both feet in a crouch position with a forward body lean. (Use pit or mat for landing).

(2) Practice in High Jump : Oblique jumps over a series of ropes of increasing heights. Take of with one foot, and try for height and light landing.

(3). Informal practices in Hop, Step and Jump with a view to executing a coordinated movement.

Ball Practices : 1. Throwing practices : Underarm, overarm, and side throws, for accuracy and power. 2. Catching practices : low, and high balls. 3. Dribbling practices on the spot using alternate hands. 4. Kicking a ball ; correct use of the inside of the foot at the base of the ball should be demonstrated for safety and better performance.

Rhythmic Practices: 1. School boys' frolic; (a) Jumping Jacks (4 counts) with partner on the spot. (b) Sliding to the right four counts. (c) Jumping Jacks on the spot-4 counts. (d) Sliding back to starting position—four counts. (e) Jumping Jacks—four counts. Repeat the same movement on the left side.

3. Repeat the steps learnt in previous lessons with "Kolattam" or "tipri"—two wooden sticks provided to each pupil.

4. Introduce any local folk dance steps.

Self-Testing Activities and Stunts

1. Revise the activities taught in the previous lessons. 2. Simple dive of low heights preferably over a partner in kneeling and arms bent position. 3. 50 yards run for speed (for boys). Emphasise natural arm action, forward body lean etc. 4. Leap frog practices.

Recreative

1. Three deep. 2. Hopping tag. 3. Spud. 4. Five passes. 5. Releasing the prisoner—lead up for *kabaddi*. 6. Circle Kho-Kho with simple rules. 7. Whip *Kabaddi* 8. Circle chase. 9. Circle pass. 10 Three-legged relay. 11. Arch ball relay. 12. Jump the stick relay. 13. Catch and throw relay. 14. Cross tag. 15. Standing broad jump: Follow on method. 16. Informal touch *Kabaddi*. 17. Informal Football (Football touch) 18. Circular Pillar Ball. 19. Moving target. 20. Ring volley-ball.

Grade VII.

Introductory: 1. Walking, running, skipping, hopping, throwing, etc. 2. Running on spot with high knee raising. 3. Start with a relaxed walk, change to brisk walking, jogging and running at top speed across playground. 4. Jumping jacks on the spot and while turning. 5. Maze running. 6. Circle chase. 7. Vault over, crawl under and run round. 8. Five passes. 9. Corners change (with new activities). 10. Free cartwheels. 11. Fisherman's net. 12. School boys frolic steps taught. 13. Giant strides across playground. 14. Touch hands and run. 15. Jumping over marked spaces and ending with a cartwheel. 16. Quick off the mark. 17. Bombardment. 18. Keep the ball up. 19. Running circle catch. 20. Free marching.

Formal Exercises

1. Fundamental commands, turnings numbering, open and close order formations. 2. Marching in a file or twos. 3. Arms forward upward, forward, downward—4 counts. 4. Arms sideward upward, sideward downward—4 counts, 5. Arms forward, step left foot forward, arms upward, heels raise and back to position in four counts. Repeat on the right. 6. Arms sideward, left foot sideward step. Arms upward and heels raise. Back to starting position in four counts. Repeat on the right. 7. Arms raising forward, upward, trunk bending forward downward to touch the ground with hands, raise the arms upwards and come to starting position—4 counts. 8. Feet apart with hip firm—Bend the trunk to left and raise the trunk and come back to original position—4 counts.

Indigenous Exercises : 1. Revise the exercises learnt in the previous grade. 2. Ordinary Dand. 3. Ordinary Bithak.

Lezim : Revise the exercises previously taught. 1. Pavitra Do Rukh. 2. Ghum Jao. 3. Age phelang. 4. Peeche phelang 5. Johar Chal.

Apparatus Work : Dumbells ; Free-hand exercises can be done with dumbells with the exception that introduced exercises in which the dumbells can be conveniently cliked.

Wand Exercises : Fundamental positions : Carry wands, wands in position etc. 1. Toe touching series. 2. Stepping series.

Asanas : 1. Dhanurasan, 2. Matsyasana, 3. Shalabhasana.

Special Activities :

Jumps : 1. Practices in standing and running broad jump. 2. Practices in standing and running high jump. 3. Free practice in hop, step and jump for coordination purposes.

Ball Practices : 1. Fielding practices with a tennis or cricket ball. 2. Catching a low, high ball and fielding ground balls. Demonstrate the correct techniques of getting under or behind a ball, keeping the eyes on the ball, preparing a cup of the hands. "Drawing in" of the hands with the impact of the ball (to avoid resistance) closing the Cup of hands, etc. 3. Bowling practices: Fundamental skill of overarm and circular movement of the bowling arm. 4. Throwing practices for power and accuracy. Aim at objects placed or marked against a wall from a suitable distance.

Rhythmics : 1. Revise the movements taught in the previous Grade. 2. 'Kolattam' or 'Tipri' Steps. 3. School boys' frolic; Include (a) See-saw: one partner sits down, the other standing reverse and repeat twice each movement in four counts. On the spot, moving right and left sideways as previously indicated. (b) slapping : one partner fakes slapping by bringing the hand close to the opponent's cheek while the opponent claps his own hands in front of him. Reverse the process. Two slap and clap alternately twice by each person. On the spot, sliding right and left sideways as before. (c) Hook arms with partner and go round once four counts. On the spot to the right and left respectively.

Self Testing Activities and Stunts : 1. Revise the activities taught previously. 2. Two or more forward and backward rolls done continuously—from a file formation. 3. Continuous leap frog with a final cartwheel. 4. Practices in handstand, head-stand etc. Against a wall or with one partner. 5. 50 yards run for speed.

Recreative : 1. Wild horses ; Variation, mount the horse at the end of capture. 2. King of the circle. 3. Circle Kho. Kho. 4. Off the circle. 5. Swinging rope jump. 6. Jump the shot. 7. Playground football. 8. Captain ball. 9. Ten passes. 10. Line soccer. 11. Over and under relay. 12. Tunnel and straddle over relay. 13. Chariotr lay. 14. Pass the buck relay. 15. Run and sit and tap relay. 16. Head balancing relay. 17. *Gulli Danda.* 18. Volleyball. 19. Rounders. 20. *Nondi or Langadi.*

Grade VIII.

Introductory : 1. Walking, running. jumping, throwing etc. 2. Maze running. 3. Running in circle, clapping on every alternate or fourth count. 4. Jumping forward, backward and sidewards in loose groups. 5. Vault over, crawl under and run round. 6. Childrens' frolic. 7. Jumping jacks moving forward and backward. 8. Running in a file, wheeling left or right. 9. Back to back tag. 10. Simple tag. 11. Free and caught. 12. Cock fighting. 13. Fisherman's net. 14. Wild horses. 15. Change between free galloping, low skip jumps and running with knees high. 16. Ball scramble. 17. Giant strides across playground, and race back to starting position. 18. Free skipping, at signal join crossed hands with partner and spin round on the spot. 19. Free running, alternately bouncing and throwing a ball from one hand to the other. 20. Keep the balls up.

Formal Exercises

1. Marching : In three or fours, wheeling etc. 2. Feet astride, both hands behind one knee, pull head to knee. Repeat several times on both sides and then crouch. 3. Kneel sitting, touch knees with head and unroll. 4. Crook lying, stretch each leg in turn as high as possible. 5. Crouch, knee stretching and bending several times. 6. Lying on back, raise arms overhead to touch the ground alternately. 7. Feet apart and arms sideways stretch, touch the left toe with right hand and right toe with the left alternately. 8. Lunge left foot and arms forward, stretch arms sideways and return to position of four counts. 9. Rise on heels, arms sideways and full knee bend with arms bent in front—4 counts. 10. Feet apart and arms sideways, twist the trunk to left and right side.

Lezim : Revise the exercises taught in the previous grade .

Teach . 1. Chandravat. 2. Chandravat baithak, 3. Domal, 4. Domal Baithak. 5. Gaj Bel. 6. Sher Dhaj. 7. Mo Mia, 8. Gol Chal.

Wand Exercises : 1. Lunging series, 2. Leg Raising. 8. Knee bending.

Dumbells : Revise exercises.

Indian Clubs : Fundamental positions. 1. Outward circle—single arm. 2. Inward circle—single arm. 3. Repeat with both arms. 4. Outward circles one at the side and one behind—single arm, alternate and with both hands. 5. Inward circles : one in front, and the other behind the back—single arm, alternate and both hands.

Asanas : 1. Paschimotanasana. 2. Halasana 3. Veeparit Kari 4. Sarvangasana. 5. Seersasana. The last two *asanas* to be done for a very short time only.

Dands : 1. Scorpion Dand. 2. Frog Dand. 3. Leap Dand. 4. Turning Dand.

Special Activities

Jumps : Teach simple fundamental skills in long jump and high jump.

Starts for sprints races : Crouch start. Emphasise a faster getaway, short strides, forward body lean position, natural arm action etc.

Major Games : Simple fundamental skills of Kho-Kho, *Kabaddi,* Football, Volley-ball, *Gulli Danda,* etc.

Rhythmics : Revise the steps that have been taught.

Introduce local folk dances. Music accompaniments should receive special attention whenever possible.

Self-Testing Activities and Stunts

1. Horizontal bar—chinning, hanging, swinging etc.

2. Simple pyramids in smaller groups.

3. Handstand, earthwheel, headstand, diving etc.

Recreative : 1. Pull into circle. 2. Magic wand. 3. Three court dodge ball. 4. Flying Dutchman. 5. Three deep. 6. Luggage van. 7. Circle Kho-Kho. 8. Circle Rush. 9. Ten passes. 10. Captain ball. 11. Pin Soccer. 12. Valley-ball. 13. *Gulli Danda.* 14. Mount tag. 15. Leap Frog relay. 16. Kangaroo ball relay. 17. Sedan chair relay. 18. Skinnig the snake. 19. Toss and catch relay. 20. Dumbbell push relay.